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## **I. REAL PARTY IN INTEREST**

The real party in interest is Aristocrat Technologies Australia Pty Limited, having a place of business at 85 Epping Road, North Ryde NSW 2113, Australia.

## **II. RELATED APPEALS AND INTERFERENCES**

In addition to this appeal, Patent Owner is also appealing rejections issued in Application Nos. 11/441,315 and 11/754,065, which are all owned by the Patent Owner and are related to the application at issue in this appeal. To date, no decisions have been rendered for the appeals of Application Nos. 11/441,315 and 11/754,065.

Applicant is not currently aware of any other proceedings that may be related to, directly affect or be directly affected by, or have a bearing on the Board's decision in the present appeal.

## **III. STATUS OF CLAIMS**

Claims 1-4, 6-20, 22-33, and 44-50 are currently pending and presently stand rejected. Claims 5, 21, and 34-43 were cancelled without prejudice or disclaimer.<sup>1</sup> Applicant identifies claims 1-4, 6-20, 22-33, and 44-50 as the claims being appealed. The text of the pending claims involved in this Appeal is provided in the Claims Appendix.

## **IV. STATUS OF AMENDMENTS**

The present application was originally filed as a PCT application on June 18, 2004, and claimed priority to an Australian patent application filed on June 19, 2003. The international application was filed in the U.S. on December 16, 2005, and was accompanied by a Preliminary Amendment that amended claims 1-9, 12, 13, 18, 19, 21-25, 31, and 34.<sup>2</sup>

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<sup>1</sup> See August 12, 2009 Amendment Under 37 C.F.R. § 1.114 at 2, 3.

<sup>2</sup> 12/16/2005 Preliminary Amendment at 2-7.

On May 28, 2008, a Non-Final Office Action issued that rejected the claims under 35 U.S.C. § 103(a).<sup>3</sup> In response, an Amendment was filed on November 26, 2008, that amended claims 1-4, 6-9, 15-20, 22-25, and 31-33, and cancelled claims 5, 21, and 34-43.<sup>4</sup> On December 3, 2008, a personal interview was conducted with the Examiner, Supervisory Examiner, and an attorney for Applicant that discussed claim 1 and some of the references cited in the Non-Final Office Action.<sup>5</sup> Based on the interview, the Applicant agreed to submit a Supplemental Amendment that brought out the discussed distinction between Applicant's invention and U.S. Patent No. 6,846,238 (Wells).<sup>6</sup> The Supplemental Amendment was filed on December 23, 2008, and amended claims 1-4, 6-9, 12, 14-20, 22, 23, 28, and 30, and added claims 44 and 45.<sup>7</sup>

On April 1, 2009, a Final Office Action issued rejecting claims 1 and 18 under 35 U.S.C. § 112, paragraph 1, and rejected all claims under 35 U.S.C. § 103(a).<sup>8</sup> On August 3, 2009, Applicant filed a Request for Continued Examination and an Amendment Under 37 C.F.R. § 1.114 that disputed the rejection of claims 1 and 18 under 35 U.S.C. § 112, paragraph 1, and addressed the rejections under 35 U.S.C. § 103(a).<sup>9</sup> That Amendment also amended claims 1 and 18 and added claims 46-48.<sup>10</sup>

On September 15, 2009, a Non-Final Office Action issued rejecting the pending claims under 35 U.S.C. § 103(a), including rejecting independent claim 1 based on U.S. Patent No. 5,429,361 (Raven) in view of U.S. Patent No. 5,954,583 (Green), and independent claim 18

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<sup>3</sup> 5/28/2008 Non-Final Office Action at 2-12.

<sup>4</sup> 11/26/2008 Amendment at 2-6.

<sup>5</sup> 12/10/2008 Statement Of Substance Of Interview at 1.

<sup>6</sup> *Id.* at 1-2.

<sup>7</sup> 12/23/2008 Supplemental Amendment.

<sup>8</sup> April 1, 2009 Final Office Action at 2-10.

<sup>9</sup> Amendment Under 37 C.F.R. § 1.114 at 9-12.

<sup>10</sup> *Id.* at 2-8.

based on Raven in view of U.S. Pat. No. 6,634,942 (Walker).<sup>11</sup> On January 14, 2010, an Amendment was filed that amended claims 1, 2, 18, and 46, and added claims 49 and 50.<sup>12</sup>

A personal interview was conducted in April 21, 2010, with the Examiner, Supervisory Examiner, and an attorney for Applicant that addressed independent claims 1 and 18 and the Raven and Green references.<sup>13</sup> The Interview Summary states: “[d]iscussed Raven (U.S. Patent No. 5,429,361) and Green (U.S. Patent No. 5,954,583) and looking at the amended claims, they appear to overcome the prior art.”<sup>14</sup> Yet, on June 22, 2010, a Final Office Action issued again rejecting the pending claims under 35 U.S.C. § 103(a), including independent claims 1 and 18 on the same art that Applicant had apparently previously overcome.<sup>15</sup>

A Notice Of Appeal was filed on September 10, 2010. There are no currently pending amendments.

## V. SUMMARY OF CLAIMED SUBJECT MATTER

### A. Independent Claim 1

Independent claim 1 is directed to a gaming system, and recites:

A gaming system including a system controller, a credit establishment facility, a plurality of gaming machines, a communications system connecting each of the plurality of gaming machines to the system controller, and a player identification device for association with player credit,

each of the gaming machines having

- (1) a credit recording facility,
- (2) a player input device,

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<sup>11</sup> 9/15/2009 Non-Final Office Action at 2, 8.

<sup>12</sup> 1/14/2010 Amendment at 2-8.

<sup>13</sup> 4/26/2010 Interview Statement.

<sup>14</sup> *Id.* (emphasis added).

<sup>15</sup> 6/22/2010 Final Office Action at 2, 9.

(3) a player identification input device responsive to a player identification device; and

(4) a game controller to play a game when a player has established a credit in the credit recording facility of the respective gaming machine,

wherein the credit establishment facility includes a terminal connected to the communications system for transfer of player credits via the communication system to a selected gaming machine selected for play of a game, said terminal located remotely from the selected gaming machine and arranged to establish a player credit and to associate that credit with a player identification device of the player establishing the credit, and wherein said player credit is transferred to the gaming machine selected for play, and said player credit being held in said credit recording facility of the gaming machine selected for play, and wherein the gaming machine selected for play is locked so that the gaming machine no longer operates to play a game by any player solely when player credit held in the credit recording facility of the respective gaming machine selected for play is non-zero, and via player action unlocked so that the gaming machine selected for play operates to play a game when the gaming machine selected for play is supplied via the identification input device with the player identification device associated with the player credit held in the credit recording facility of the respective gaming machine.<sup>16</sup>

As recited, a gaming system includes a system controller 54, a credit establishment facility 59, a plurality of gaming machines 10, a communications system connecting each of the plurality of gaming machines 10 to the system controller 54, and a player identification device 27 for association with player credit.<sup>17</sup> Each of the gaming machines 10 has a credit recording facility, a player input device 22, 29, a player identification input device 24.3 responsive to a player identification device 27, and a game controller 36 to play a game when a player has established a credit in the credit recording facility of the respective gaming machine 10.<sup>18</sup> The credit establishment facility 59 includes a terminal connected to the communications system for transfer of player credits via the communication system to a selected gaming machine 10

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<sup>16</sup> Application at claim 1.

<sup>17</sup> See, *id.* at, for example, page 5, lines 22-27; page 7, lines 16-27; Figures 3 and 4.

<sup>18</sup> See, *id.* at, for example, page 5, lines 9-17; page 5, line 28 – page 6, line 2; Figures 1-4.

selected for play of a game.<sup>19</sup> The terminal is located remotely from the selected gaming machine 10 and arranged to establish a player credit and to associate that credit with a player identification device 27 of the player establishing the credit, wherein the player credit is transferred to the gaming machine 10 selected for play.<sup>20</sup> The player credit is held in the credit recording facility of the gaming machine 10 selected for play.<sup>21</sup> The gaming machine 10 selected for play is locked so that the gaming machine 10 no longer operates to play a game by any player solely when player credit held in the credit recording facility of the respective gaming machine 10 selected for play is non-zero, and via player action unlocked so that the gaming machine 10 selected for play operates to play a game when the gaming machine 10 selected for play is supplied via the identification input device with the player identification device 27 associated with the player credit held in the credit recording facility of the respective gaming machine 10.<sup>22</sup>

#### **B. Independent Claim 18**

Independent claim 18 recites:

A gaming machine for connection to a gaming system wherein the gaming system comprises a system controller, a plurality of gaming machines, and a communications system connecting each of the plurality of gaming machines to the system controller, the gaming machine comprising

- (1) a credit recording facility,
- (2) a player input device,
- (3) a tracking input device responsive to a player tracking device, and

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<sup>19</sup> See, *id.* at, for example, page 5, lines 22-27; page 7, lines 30-33; Figures 4, 5A.

<sup>20</sup> See, *id.* at, for example, page 5, line 22 – page 6, line 2; page 7, line 28-4; Figures 4, 5A.

<sup>21</sup> See, *id.* at, for example, page 1, line 31 – page 2, line 11; page 5, lines 22-27.

<sup>22</sup> See, *id.* at, for example, page 1, line 31 – page 2, line 11; page 5, line 28-page 6, line 2; page 7, line 30 – page 8, line 6.



(4) a game controller arranged to play a game when a player has established a credit in the credit recording facility of the gaming machine,

wherein one gaming machine of the plurality of gaming machines is locked so that the one gaming machine no longer operates to play a game by any player, solely at a time when player credit held in the credit recording facility of the one gaming machine is non-zero, and automatically unlocked to allow play when a player tracking device is afterward supplied to the tracking input device of another gaming machine, and credit associated with the credit held in the credit recording facility of the one gaming machine is automatically transferred to the credit recording facility of the other gaming machine in response to the player tracking device being supplied to the tracking input device of the other gaming machine.<sup>23</sup>

As recited, a gaming machine 10 for connection to a gaming system wherein the gaming system comprises a system controller 54, a plurality of gaming machines 10, and a communications system connecting each of the plurality of gaming machines 10 to the system controller 54.<sup>24</sup> The gaming machine 10 comprises a credit recording facility, a player input device 22, 29, a tracking input device 24.3 responsive to a player tracking device 27, and a game controller 36 arranged to play a game when a player has established a credit in the credit recording facility of the gaming machine 10.<sup>25</sup>

One gaming machine 10 of the plurality of gaming machines 10 is locked so that the one gaming machine 10 no longer operates to play a game by any player, solely at a time when player credit held in the credit recording facility of the one gaming machine 10 is non-zero, and automatically unlocked to allow play when a player tracking device 27 is afterward supplied to the tracking input device 24.3 of another gaming machine 10.<sup>26</sup> Credit associated with the credit held in the credit recording facility of the one gaming machine 10 is automatically transferred to

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<sup>23</sup> See, *id.* at, claim 18.

<sup>24</sup> See, *id.* at, for example, page 5, lines 22-27; page 7, lines 16-27; Figures 3 and 4.

<sup>25</sup> See, *id.* at, for example, page 5, lines 9-17; page 5, line 28 – page 6, line 2; Figures 1-4.

the credit recording facility of the other gaming machine 10 in response to the player tracking device 27 being supplied to the tracking input device 24.3 of the other gaming machine 10.<sup>27</sup>

**C. Claim 23**

Claim 23 depends on claim 22, which depends on claim 18, and recites that the gaming machine 10 includes a credit importing facility such that when a player tracking device 27 is supplied to a gaming machine 10 that is not currently holding a player credit in its credit recording facility and is unlocked, the gaming machine 10 will signal the system controller 54 to transfer the player credit of the player supplying the player tracking device 27 to the credit recording facility of the respective gaming machine 10.<sup>28</sup>

**D. Claim 24**

Claim 24 depends on claim 23 and recites the feature that the player credit held in the system controller 54 is transferred to the credit recording facility of the machine 10 selected by the player when the player inserts the associated player tracking device 27 into the tracking input device 24.3 of the selected machine 10.<sup>29</sup>

**E. Claim 46**

Claim 46 depends on claim 1 and recites the feature that the selected gaming machine 10 is locked to prevent play when credits are transferred by the terminal prior to the selected gaming machine 10 being supplied with the player identification device 27.<sup>30</sup>

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<sup>26</sup> See, *id.* at, for example, page 1, line 31 – page 2, line 11; page 5, line 28–page 6, line 2; page 7, line 30 – page 8, line 6.

<sup>27</sup> See, *id.* at, for example, page 6, lines 12-16; page 9, lines 5-11; page 10, lines 20-26.

<sup>28</sup> See, *id.* at, for example, page 3, lines 23-26.

<sup>29</sup> See *id.*

<sup>30</sup> See, *id.* at, for example, page 7, line 28 – page 8, line 6.

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1) The rejection of claims 1, 6-14, 23-29, 32, and 46-48 under 35 U.S.C. § 103(a) based on U.S. Patent No. 5,429,361 (Raven) in view of U.S. Patent No. 5,954,583 (Green).<sup>31</sup> Surprisingly, while dependent claims 23-29 and 32 were rejected on this basis, the broader independent claim from which they depend (claim 18) was not.

2) The rejection of claims 2, 3, 19, 20, 26, 44, and 45 under 35 U.S.C. § 103(a) based on Raven in view Green and in further view of U.S. Pub. No. 2003/0220138 (Walker Publication).<sup>32</sup>

3) The rejection of claims 14 and 30 under 35 U.S.C. § 103(a) based on Raven in view of Green and in further view of U.S. Patent No. 6,638,169 (Wilder).<sup>33</sup>

4) The rejection of claims 15-17, 32, and 33 under 35 U.S.C. § 103(a) based on Raven in view of Green and in further view of U.S. Patent No. 7,107,245 (Kowalick).<sup>34</sup>

5) The rejection of claims 18 and 22-29 under 35 U.S.C. § 103(a) based on Raven in view of U.S. Patent No. 6,634,942 (Walker) and, apparently, in view of Green.<sup>35</sup>

6) The rejection of claim 49 under 35 U.S.C. § 103(a) based on Raven in view of Green and in further view of U.S. Patent No. 5,265,874 (Dickenson).<sup>36</sup>

7) The rejection of claim 50 under 35 U.S.C. § 103(a) based on Raven in view of Green and in further view of U.S. Patent No. 6,916,244 (Gatto).<sup>37</sup>

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<sup>31</sup> 6/22/2010 Final Office Action at 2, 6.

<sup>32</sup> *Id.* at 7-8, 13.

<sup>33</sup> *Id.* at 8, 14.

<sup>34</sup> *Id.* at 9, 14.

<sup>35</sup> *Id.* at 9-11 (the Final Office Action states the rejection is based on Raven in view of Walker, but the discussion of the rejection of independent claim 18 also relies on Green).

<sup>36</sup> *Id.* at 15.

<sup>37</sup> *Id.*

8) The rejection of claim 31, which Applicant respectfully submits the Final Office Action does not appear to identify the basis for the rejection.<sup>38</sup>

## VII. ARGUMENT

Two months after declaring that Applicant's amendments to independent claims 1 and 18 "**appear to overcome the prior art**," the Final Office Action rejected those claims based on the same art Applicant had apparently overcome.<sup>39</sup> As shown below, the obviousness rejections of the pending claims are both unsupported by fact and incorrect. Patent Owner therefore respectfully requests that the Final Office Action be reversed, and that the pending claims be allowed.

"The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness."<sup>40</sup> If the Examiner does not produce a *prima facie* case, Patent Owner is under no obligation to submit evidence of non-obviousness.<sup>41</sup> As specifically noted in the MPEP, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art."<sup>42</sup> Further, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art."<sup>43</sup> As discussed below, the Final Office Action's obviousness rejections fail to establish a *prima facie* case of obviousness.

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<sup>38</sup> *Id.*

<sup>39</sup> 4/26/2010 Interview Statement (emphasis added).

<sup>40</sup> Manual of Patent Examining Procedure ("MPEP") § 2142 at 2100-127 (8th Ed. Rev. 6, Sept. 2007).

<sup>41</sup> *Id.*

<sup>42</sup> See MPEP at 2143.03 at 2100-131.

<sup>43</sup> See *id.* (quoting *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (CCPA)).

**A. Independent Claim 1 And Its Associated Dependent Claims**

**1. Rejections Based On Raven In View Of Green**

Independent claim 1 and associated dependent claims 6-14, 23-29, 32, and 46-48 were rejected under 35 U.S.C. § 103(a) based on Raven in view of Green.<sup>44</sup> As shown below, as Raven and Green do not teach or suggest all of the features recited in claim 1, the Final Office Action has not, and can not, establish a *prima facie* conclusion of obviousness.

**a. Neither Raven Nor Green Disclose Player Credit Transferred And Held In A Gaming Machine Prior To The Gaming Machine Being Supplied With A Player's Card Associated With The Transferred Player Credit**

Independent claim 1 and dependent claim 46 include features that are improvements over prior line-of-sight gaming systems. In particular, prior line-of-sight gaming systems involved a player giving money to a cashier who then instructs the gaming system to place credits on a gaming machine selected for play by the player.<sup>45</sup> These systems require (or should require) that the cashier be able to see that no one else uses the gaming machine after the player's credits have been placed on the gaming machine.<sup>46</sup>

Independent claim 1 includes the feature of a credit establishment facility that includes a terminal located remotely from the gaming machine selected for play of a game.<sup>47</sup> The terminal is arranged to establish a player credit and to associate that credit with a player identification device, such as, for example, a player's card.<sup>48</sup> The player credit established at the terminal is transferred to the gaming machine selected for play, where that transferred player credit is held

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<sup>44</sup> 6/22/2010 Final Office Action at 2, 6.

<sup>45</sup> Application at page 1, lines 10-14.

<sup>46</sup> *Id.*

<sup>47</sup> *Id.* at claim 1.

<sup>48</sup> *Id.*

in the credit recording facility of the selected gaming machine.<sup>49</sup> The selected gaming machine that is holding the player credit is then locked so that the gaming machine can no longer operate to play a game by any player, due solely to the player credit held in the credit recording facility being non-zero.<sup>50</sup> Finally, the selected gaming machine holding the player credits is unlocked, by way of player action, when the selected gaming machine is supplied with the player identification device that is associated with the player credit being held in the credit recording facility of the selected gaming machine.<sup>51</sup>

Dependent claim 46 expressly defines the gaming machine selected for play as being “locked to prevent play when credits are transferred by said terminal prior to the selected gaming machine being supplied with the player identification device.”<sup>52</sup>

In rejecting independent claim 1 and dependent claim 46, the Final Office Action asserts that Raven discloses “the main computer sends credit to the gaming device only after the player has inputted their player card with an associated personal identification number.”<sup>53</sup> Specifically, Raven discloses the cashless operation of a gaming machine in which a player inserts a magnetic card into a card reader and keypad unit (DMK) 12 that is mounted to the side of the gaming machine 10.<sup>54</sup> After the DMK 12 detects the insertion of the magnetic card, the DMK 12 prompts the player to enter both a personal identification number (PIN) and the credit amount desired to be used for the game.<sup>55</sup> The PIN and credit amount are then transmitted to the system

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<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> *Id.*

<sup>52</sup> *Id.* at claim 46.

<sup>53</sup> 6/22/2010 Final Office Action at 3.

<sup>54</sup> Raven at 2:24-27.

<sup>55</sup> *Id.* at 10:49-55.

for verification.<sup>56</sup> After proper verification, the main computer 16 returns an authorization code to the circuit board (MASTERCOM) 14 of the gaming machine 10, and the verified amount is shown on the display of the DMK 12.<sup>57</sup> Raven indicates that game play is then allowed to proceed.<sup>58</sup> Thus, as the Final Office Action states, in Raven, credits are transferred to the gaming machine “only after” the player has inserted the player’s card into the gaming machine.<sup>59</sup>

Unlike Raven, claims 1 and 46 of the present application recite the feature that player credit is transferred and held in the recording facility of the gaming machine before the player has supplied the selected gaming machine with the player identification device. As claim 1 of the present application recites, the gaming machine is locked so that the gaming machine no longer operates to play a game by any player when player credit held in the recording facility of the selected gaming machine is non-zero, and unlocked for play, via player action, when the gaming machine is supplied with the player identification device associated with the player credit held in the credit recording facility of the gaming machine.<sup>60</sup> Additionally, claim 46 recites that the “selected gaming machine is locked ... when credits are transferred by said terminal prior to the selected gaming machine being supplied with the player identification device.”<sup>61</sup> These features in claims 1 and 46 prevent another player from playing the gaming machine with credits of another player that were established at the remote terminal and transferred to the gaming machine.

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<sup>56</sup> *Id.* at 55-58.

<sup>57</sup> *Id.* at 10:59-62.

<sup>58</sup> *Id.* at 10:62-64.

<sup>59</sup> *Id.* at 10:49-64; 6/220/10 Final Office Action at 3.

<sup>60</sup> Application at claim 1.

<sup>61</sup> *Id.* at claim 46.

Accordingly, for at least the above reasons, Applicant respectfully submits that Raven and its disclosure of credits being established at the gaming machine "only after" the player has inserted the player's card into the gaming machine (as asserted by the Final Office Action) does not teach or suggest these features of claims 1 and 46.<sup>62</sup>

The Final Office Action also does not, and cannot, assert that these features are taught or suggested by Green. Green discloses the use of a player's card that is an intelligent key 25, which has a memory that contains information indicating the amount of credit available to the owner of the key for playing the gaming machines 49.<sup>63</sup> The number of credits on the intelligent key 25 is also double checked with the user's account information that is "held on data base by the central computer 42."<sup>64</sup> Therefore, in Green, credits are not held in the credit recording facility of the gaming machine before the player inserts the player's card into a card reader, but are instead maintained on the player's card.

For at least these reasons, Applicant respectfully submits that claims 1 and 46, as well as associated dependent claims 2-4, 6-17, 45, and 47-50 are in condition for allowance.

**b. Raven Does Not Disclose A Terminal Remotely Located  
From The Selected Gaming Machine For Establishing  
And Transferring Of Credits**

Independent claim 1 also includes the features of a credit establishment facility including a terminal that is located remotely from the gaming machine selected for play that is arranged to establish player credit and associate that player credit with a player identification device, and

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<sup>62</sup> 6/220/10 Final Office Action at 3.

<sup>63</sup> Green at 9:44-59.

<sup>64</sup> *Id.* at 9:60-67.



which is connected to a communications system for the transfer of the player credits to the selected gaming machine.<sup>65</sup>

Raven discloses an embodiment using magnetic cards where credits are established at the gaming machine, and not at a remote terminal, as recited in claim 1.<sup>66</sup> In Raven, the player inserts a magnetic card into the DMK 12.<sup>67</sup> Unlike the feature in independent claim 1 of the terminal being remotely located from the gaming machine, Figure 2 of Raven illustrates the DMK 12 as being mounted to the cabinet of the gaming machine.<sup>68</sup> With the magnetic card inserted into the DMK 12, the player establishes credit at the gaming machine by entering the player's personal identification number (PIN) and a desired credit amount into the DMK 12.<sup>69</sup> This information is then transmitted to the system for verification.<sup>70</sup> If verified, the main computer 16 returns an authorization amount and code to the MASTERCOM 14, which is also located at the gaming machine.<sup>71</sup> When play is complete, the remaining credits that were established on the gaming machine are transferred to a main computer 16 and stored on the system.<sup>72</sup> When the player later wishes to use these already established credits, the player requests (at the gaming machine) a transfer of those credits from the system.<sup>73</sup> Thus, Raven discloses the establishment of credits at the gaming machine, and does not teach or suggest establishing credits at a terminal remotely located from the gaming machine.

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<sup>65</sup> Application at claim 1.

<sup>66</sup> See Raven at 10:44-62.

<sup>67</sup> *Id.* at 47-49.

<sup>68</sup> *Id.* at 2:24-27.

<sup>69</sup> *Id.* at 10:49-55.

<sup>70</sup> *Id.* at 10:55-58.

<sup>71</sup> *Id.* at 59-62.

<sup>72</sup> *Id.* at 11:14-18, 11:58-60.

<sup>73</sup> *Id.* at 11:60-62.

In addition to the use of a magnetic card, Raven also discloses the use of a smart or memory card, which has on-board memory.<sup>74</sup> The smart card is the player's "bank," as the on-board memory keeps track of the credits available to the player.<sup>75</sup> Thus, the memory on the smart card allows for bets to subtracted (debited) or added (credited) to the player's card.<sup>76</sup> However, because the number of credits is maintained on the card, the use of a smart card does not teach or suggest the features of claim 1 regarding establishing credits at a remote terminal and transferring those credits to a gaming machine selected for play. Additionally, smart cards do not teach or suggest the feature of claim 1 that the transferred player credits are held in the credit recording facility of the gaming machine selected for play, or the unlocking of the gaming machine, via player action, when the player identification device associated with the player credits is supplied to the gaming machine.

For at least these reasons, Applicant respectfully submits that claim 1, as well as associated dependent claims 2-4, 6-17, and 45-50 are in condition for allowance.

## **2. Rejections Of Claims Dependent On Claim 1**

For at least the reasons discussed above with respect to claim 1 and dependent claim 46, Applicant respectfully submits that rejected claims 2-4, 6-17, and 44-50 (which directly or indirectly depend on claim 1) are also allowable over Raven and Green in combination with U.S. Pub. No. 2003/0220138 (Walker Publication), U.S. Patent No. 6,638,169 (Wilder), U.S. Patent No. 7,107,245 (Kowalick), U.S. Patent No. 5,265,874 (Dickinson), and U.S. Patent No. 6,916,244 (Gatto). Applicant respectfully submits that the flat rate play system of the Walker Publication, the gaming machines having directed sound systems of Wilder, the biometric

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<sup>74</sup> *Id.* at 11:24-20.

<sup>75</sup> *Id.* at 11:29-37.

gaming access system of Kowalick, the validation terminals of Dickenson, and the server-less gaming system of Gatto do not remedy the above-discussed deficiencies of Raven and Green.

Accordingly, for at least these reasons, Applicant respectfully submits that dependent claims 2-4, 6-17, and 44-50 are also in condition for allowance.

**B. Independent Claim 18 And Its Associated Dependent Claims**

**1. Rejections Based On Raven In View Of Walker**

Independent claim 18 includes features relating to unlocking a locked gaming machine when a player tracking device is supplied to another gaming machine. Additionally, claim 18 recites features relating to the credit that was held in the credit recording facility of the locked gaming machine being automatically transferred to the other gaming machine in response to the player tracking device being supplied to the tracking input device of the other gaming machine.

The Final Office Action states that claim 18 was rejected “under 35 U.S.C. § 103(a) as being unpatentable over Raven in view of Walker (U.S. Patent No. 6,634,942),” but also relies on Green when discussing the rejection of claim 18. Regardless of which combination of references were applied, as discussed below, neither Raven, Walker, nor Green teach or suggest the above-identified features of claim 18.

The Final Office Action admits that Raven and Green fail to disclose features relating to the transfer of credits from a locked gaming machine to another gaming machine when the player tracking device is inserted into the other gaming machine:

Raven in view of Green fails to disclose that the gaming machine is locked so that when a player tracking device is supplied to the tracking input device of another gaming machine, and credit associated with the credit held in the credit recording facility of one gaming machine is transferred to the credit recording facility of the other gaming machine.

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<sup>76</sup> *Id.*

The Final Office Action does not explicitly address whether either Raven or Green disclose another feature of claim 18, namely that a locked gaming machine is unlocked when a player tracking device is supplied to another gaming machine. Applicant respectfully submits that neither Raven nor Green teach or suggest this feature. Instead, Raven merely discloses that when a player has reserved a gaming machine reinserts his card into that same gaming machine, play may resume.<sup>77</sup> Green provides even less disclosure, merely stating that a player may reserve a gaming machine that has credits on it and without having his key in the machine, “and get a drink – etc” and the game will not accept any other key.<sup>78</sup> Applicant respectfully submits that these disclosures do not teach or suggest the claimed feature that a locked gaming machine may be unlocked by the insertion of a player tracking device into an other gaming machine, let alone the automatic transfer of credits held in the credit recording facility of the previously locked gaming machine to the other gaming machine.

In view Raven’s and Green’s lack of teaching or suggestion of the above-identified features of claim 18, the Final Office Action resorts to relying on Walker. The Final Office Action alleges that Walker discloses that a player can play a game machine and then proceed to another game machine and, by inserting their card, unlock the previous gaming machine.<sup>79</sup> Applicant respectfully disagrees.

In Walker, a player may initiate automated game play at a first gaming machine so that the player may maximize playing time without needing to be physically present at the first gaming machine.<sup>80</sup> Walker includes an embodiment in which, during automated game play of a

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<sup>77</sup> Raven at 8:31-32.

<sup>78</sup> Green at 12:10-13.

<sup>79</sup> 6/22/10 Final Office Action at 11.

<sup>80</sup> Walker at 3:3-10.

first gaming machine, the player may manually terminate the automatic game play session at any available gaming machine, such as at a second gaming machine.<sup>81</sup> In Walker, after the player inserts a player tracking card into the second gaming machine and the player identification information has been verified, information regarding the automated game play at the first gaming machine is transmitted to, and displayed by, the second gaming machine.<sup>82</sup> The player may then decide whether to terminate the automated game play, allow the automated game play to proceed, or terminate the automated game play and proceed with manual play at the second gaming machine.<sup>83</sup> If the player elects to terminate the automated game play, the player may receive a payout, which Walker discloses may involve a gaming machine dispensing coins or the player presenting the player tracking card at the slot change booth or casino cage.<sup>84</sup>

Walker fails to disclose that the first gaming machine is locked so that the one gaming machine no longer operates to play a game **by any player**. To the contrary, in Walker, the first gaming machine is engaged in an automatic game play session, which rather than no longer operating to play a game, is intended to “maximize [the player’s] playing time on a gaming device or devices ....”<sup>85</sup> Thus Walker does not teach or suggest unlocking a gaming machine that was no longer operating to play a game by any player when a player tracking device is afterward supplied to the tracking input device of another gaming machine, as recited in claim 18 of the present invention.

Walker also does not teach or suggest that a locked gaming machine is automatically unlocked when a player tracking device is supplied to the player tracking input device of another

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<sup>81</sup> *Id.* at 15:37-43.

<sup>82</sup> *Id.* at 15:40-52.

<sup>83</sup> *Id.* at 15:54-56, 15:66-16:10.

<sup>84</sup> *Id.* at 16:11-25, Figure 9.

gaming machine. Instead as described in the section of Walker cited in the Final Office Action, and as show in Figure 9 of Walker, after the player inserts the player tracking card into the second gaming machine, the second gaming machine will display the results of the automated gaming play.<sup>86</sup> As Walker states, “the player may then decide to terminate game play” or let the automatic game play continue.<sup>87</sup> Therefore, Walker does not teach or suggest the feature of claim 18 that a locked gaming machine is automatically unlocked to allow game play when a player tracking device is afterward supplied to the tracking input device of another gaming machine.

Additionally, Walker does not teach or suggest that credits held in the credit recording facility of one gaming machine are automatically transferred to the credit of the credit recording facility of the other gaming machine in response to the player tracking device being supplied to the tracking input device of the other gaming machine. Instead, in Walker, after the player inserts the player tracking device into the slot machine of the second gaming machine, the second gaming machine merely displays the results of the automated game play on the display of the second gaming machine for the player to read, after which the player may terminate the automated game play.<sup>88</sup> Thus, in Walker, even after the player inserts the player’s card into the second gaming machine, game play on the first gaming machine may still to continue to proceed, indicating that credits from the first gaming machine are not automatically transferred to the credit meter of the second gaming machine.<sup>89</sup>

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<sup>85</sup> *Id.* at 3:3-6.

<sup>86</sup> 6/22/10 Final Office Action at 11 (citing Walker at 15:37-57).

<sup>87</sup> 6/22/10 Final Office Action at 11; Walker at 15:45-57.

<sup>88</sup> Walker at Figure 9, 15:37-56.

<sup>89</sup> *Id.* at 15:66-16:1.

Further, when a player elects to terminate game play on the first gaming machine from the second gaming machine, Walker provides no teaching or suggestion that the credits are automatically transferred to the credit meter of the second gaming machine. Instead, Walker merely discloses that the player may receive a pay out of the credit balance or receive a prize or reward.<sup>90</sup> And even if the player decides to resume with manual play at the second gaming machine, Walker does not teach or suggest that the credits on the credit meter of the first gaming machine are transferred to the credit meter of the second gaming machine. For at least these reasons, Walker does not teach or suggest the automatic transfer of player credits from the recording facility of a lock gaming machine to the recording facility of an other gaming machine when the tracking device is supplied to the tracking input device of the other gaming machine, as recited in claim 18.

For at least these reasons, Applicant respectfully submits that independent claim 18 and associated dependent claims 19, 20, and 22-33 are allowable over the combination of Raven and Green asserted by the Final Office Action and combination Raven, Green, and Walker discussed by the Final Office Action.

## **2. Rejection Of Claim 31**

Applicant respectfully submits that while the Final Office Action states that claim 31 is rejected, the Final Office Action does not appear to provide any basis for the rejection of claim 31. Applicant therefore respectfully submits that the Final Office Action fails to provide a *prima facie* evidence to support the rejection of claim 31.

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<sup>90</sup> *Id.* at Figure 9, 15:56-58, 16:11-31.

### 3. Rejection Of Claims 30, 32, 33

As discussed above, independent claim 18 was rejected under 35 U.S.C. § 103(a) based on Raven in view of Walker, and apparently also in view of Green.<sup>91</sup> In rejecting independent claim 18, the Final Office Action states “Raven in view of Green fails to disclose that the gaming machine is locked so that when a player tracking device is supplied to the tracking input device of another gaming machine, and credit associated with the credit held in the credit recording facility of the one gaming machine is transferred to the credit recording facility of the other gaming machine.”<sup>92</sup> Therefore, in view of the admittedly missing disclosure in Raven and Green, the Final Office Action relies on Walker in rejecting independent claim 18.<sup>93</sup>

Yet, in rejecting claims 30, 32 and 33, which depend on claim 18, the Final Office Action does not rely on any combinations that include Walker.<sup>94</sup> In fact, the first rejection of claim 32 in the Final Office Action relies on only Raven and Green, which, again, the Final Office Action admits fails to disclose all of the features of independent claim 18.<sup>95</sup> Thus, in view of the Final Office Action’s admission that Raven and Green do not disclose all of the features of independent claim 18, the reliance on just these two references in rejecting dependent claim 32 is not supported in fact, and is improper.

The Final Office Action’s second rejection of claim 32, along with the rejection of claim 33, is based on Raven, Green and Kowalick.<sup>96</sup> The Final Office Action also rejected claim 30

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<sup>91</sup> 6/22/10 Final Office Action at 9-11.

<sup>92</sup> 6/22/10 Final Office Action at 11.

<sup>93</sup> *Id.*

<sup>94</sup> *Id.* at 2, 14.

<sup>95</sup> *Id.* at 2.

<sup>96</sup> *Id.* at 14.



based Raven in view of Green and in further view of Wilder.<sup>97</sup> The Final Office Action offers no assertions that Kowalick or Wilder cures the above-discussed deficiencies of Raven and Green with respect to the features of independent claim 18. Further, Kowalick is directed to the use of a biometric registration apparatus in a cashless gaming system, and does not teach or suggest the features of independent claim 18 that the Final Office Action admits is not disclosed by Raven and Green. Similarly, Wilder pertains to gaming machines having directed sound, and also does not teach or suggested the features of claim 18 that the Final Office Action admits are missing from Raven and Green. Therefore, Applicant respectfully submits that the rejections of claims 30, 32 and 33 based on Raven in view of Green and in further view of Kowalick or Wilder is unsupported in fact and improper.

For at least these reasons, Applicant respectfully submits that the rejection of claims 30, 32, and 33, was improper and unsupported by fact. Accordingly, Applicant respectfully requests that claims 30, 32 and 33 be allowed.

**4. Rejection Of Claims 23-29 Based On Raven And Green And Raven, Green, And Walker**

Besides being rejected based on Raven, Walker, and apparently Green, claims 23-29 were also rejected based solely on Raven in view of Green.<sup>98</sup> As discussed above with respect to claims 30, 32, and 33, the Final Office Action admits that the combination of Raven and Green fails to disclose each element of independent claim 18, from which claims 23-29 depend.

Therefore, Applicant respectfully submits that, in view of the admission in the Final Office Action regarding Raven's and Green's lack of disclosure of features recited in

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<sup>97</sup> *Id.*

<sup>98</sup> *Id.* at 2.

independent claim 18, the rejection of claims dependent on claim 18, such as claims 23-29, based solely on Raven and Green is unsupported by fact and improper.

**5. Rejection Of Claim 26**

The Final Office Action rejected claim 26, which depends on claim 18, a second time based on the combination of Raven, Green, and U.S. Patent Publication 20030020138 (Walker Publication).<sup>99</sup> The Walker Publication is directed to a method and apparatus for employing flat rate pay in the play of a gaming apparatus. Yet, in rejecting claim 26, the Final Office Action did not, and cannot, assert that the Walker Publication teaches or suggests features of independent claim 18 that the Final Office Action admits are not disclosed by Raven and Green. Thus, Applicant respectfully submits that the Final Office Action fails to provide a *prima facie* case for the rejection of claim 26 based on the combination of Raven, Green, and the Walker Publication.

**6. Rejection Of Claim 23**

Claim 23 depends on claim 22 and includes the feature that when a player tracking apparatus is supplied to a gaming machine that is not currently holding a player credit, the gaming machine will signal the system controller to transfer the player credit to the credit recording facility of the gaming machine.<sup>100</sup> Claim 23 was rejected as being obvious based on both Raven in view of Green and Raven in view of Walker, and apparently in further view of Green.<sup>101</sup> Applicant respectfully disagrees.

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<sup>99</sup> *Id.* at 13.

<sup>100</sup> Application at claim 23.

<sup>101</sup> 6/22/10 Final Office Action at 2, 9, 10, 12 (the second rejection states the rejection is based on Raven in view of Walker, but the rejection of associated independent claim 18 also discusses Green).

As previously discussed with respect to claim 1, Raven discloses the cashless operation of a gaming machine in which a player inserts a magnetic card into a card reader and keypad unit (DMK) 12 that is mounted to the side of the gaming machine 10.<sup>102</sup> After the DMK 12 detects the insertion of the magnetic card, the DMK 12 prompts the player to enter both a personal identification number (PIN) and the amount of credit to be used for the game.<sup>103</sup> The entered PIN and credit amount are then transmitted to the system for verification.<sup>104</sup> After proper verification, the main computer 16 returns an authorization code to the circuit board (MASTERCOM) 14 of the gaming machine 10, and the verified amount is shown on the display of the DMK 12.<sup>105</sup>

Furthermore, Raven states that “with the magnetic card, the player must request a transfer of credits from the system each time he inserts his magnetic card.”<sup>106</sup> Thus, Raven requires that after the magnetic card has been inserted into the DMK 12, the player enters a PIN and requested credit amount, followed by verification of the PIN and the requested amount before any credit is established at, or transferred to, the gaming machine.<sup>107</sup> But unlike Raven, claim 23 recites the feature that the gaming machine signals the system controller to transfer credit that is already being held in the system controller (as recited in intervening claim 22) when the player tracking device is supplied to a gaming machine that is not currently holding credit in the credit recording facility.<sup>108</sup>

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<sup>102</sup> Raven at 2:24-27, 10:47-49.

<sup>103</sup> *Id.* at 10:49-55.

<sup>104</sup> *Id.* at 10:55-58.

<sup>105</sup> *Id.* at 10:59-63.

<sup>106</sup> *Id.* at 11:60-62.

<sup>107</sup> *See id.*

<sup>108</sup> Application at claim 23.

Raven also discloses the use of a smart card having an on-board memory rather than a magnetic card.<sup>109</sup> However, as credits are stored in the memory of the smart card and not on the system controller, the embodiments in Raven using a smart card do not, and cannot, teach or suggest the above recited features of claim 23 relating to the transfer of credits from the system controller when the player tracking device is supplied to the gaming machine.

Finally, the Final Office Action does not assert that the features of claim 23 are taught or suggested by the automated game play system of Walker.<sup>110</sup> Moreover, Walker does not teach or suggest the feature of a gaming machine signaling the system controller to transfer a player's credit held in the system controller to the credit recording facility of the respective gaming machine when the player tracking device is supplied to a gaming machine that is not currently holding credit in the credit recording facility.

For at least these reasons, Applicant respectfully submits that claim 23 is allowable over Raven in view of Green and Raven in view of Walker, and in further view of Green.

#### **7. Rejection Of Claim 24**

Claim 24 depends on claim 23 and recites the feature that credit held in the system controller is transferred to the recording facility of the selected gaming machine when the player inserts the player tracking apparatus into the tracking input device of the selected machine.<sup>111</sup> Like claim 23, claim 24 was also rejected based on both Raven in view of Green and Raven in

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<sup>109</sup> Raven at 11:24-40.

<sup>110</sup> 6/22/10 Final Office Action at 12.

<sup>111</sup> Application at claim 24.

view of Walker, and apparently in view of Green.<sup>112</sup> For at least the same reasons stated above with respect to claim 23, claim 24 is also allowable over Raven in view of Walker.

In rejecting claim 24, the Final Office Action asserts that Raven discloses that “player credit held in the system controller is transferred to the recording facility of the machine selected for play when the player inserts the associated player identification device into the player identification input device of the selected machine (column 10, lines 47-64).”<sup>113</sup> This assertion is incorrect. As Raven states, “[w]ith the magnetic card, the player must request a transfer of credits from the system each time he inserts his magnetic card.”<sup>114</sup> And as the portion of Raven cited in this rejection further illustrates, Raven requires at least entry of a magnetic card into the DMK 12, entry of a PIN and requested credit amount, and verification of the PIN and the requested amount before any credit is established at or transferred to the gaming machine.<sup>115</sup> Therefore, Raven does not teach or suggest the feature of claim 24 that credit held in the system controller is transferred to the recording facility of the selected gaming machine when the player inserts the player tracking apparatus into the tracking input device of the selected machine.

Furthermore, as discussed above, the features of claim 24 are also not taught or suggested by embodiments in Raven which use a smart card, as credits are maintained by the on-board memory of the smart card and not maintained by the system controller.<sup>116</sup>

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<sup>112</sup> 6/22/10 Final Office Action at 2, 9, 10, 12 (the second rejection states the rejection is based on Raven in view of Walker, but the rejection of associated independent claim 18 also discusses Green).

<sup>113</sup> 6/22/10 Final Office Action at 12 (emphasis added).

<sup>114</sup> Raven at 11:60-62 (emphasis added).

<sup>115</sup> *Id.* at 10:44-62, 11:60-62.

<sup>116</sup> *Id.* at 11:24-40.

For at least these reasons, Applicant respectfully submits that claim 24 is allowable over Raven in view of Green and Raven in view of Walker and in further view of Green.

**C. Raven's MASTERCOM Is Not A System Controller**

The rejection of independent claims 1 and 18 are also predicated, in part, on the Final Office Action's incorrect assertion that Raven's MASTERCOM 14 is a system controller.<sup>117</sup> Specifically, independent claims 1 and 18 of the present application include the feature of a system controller, and that a communications system connects each of the plurality of gaming machines in the gaming system to the system controller.<sup>118</sup>

Raven's MASTERCOM 14 is not a system controller, but instead are individual controllers for each gaming machine.<sup>119</sup> As Raven states, "[a] MASTERCOM 14 is required for each gaming machine 10 in the system ...."<sup>120</sup> Raven also discloses that "the MASTERCOM 14 is contained on a single board 20 ..." and "[t]he MASTERCOM board 20 is fairly compact ... and may be conveniently located inside the gaming cabinet."<sup>121</sup> Accordingly, for at least these reasons, the MASTERCOM 14 of Raven is not a system controller, but instead are separate control units used by each of the individual gaming machines 10.

Further, the MASTERCOM 14 of Raven does not satisfy the requirement of claim 1 that a communication system connects each of the plurality of gaming machines to the system controller. Instead, as shown in Figure 3 of Raven, each MASTERCOM 14 is wired to: (1) a DMK 12; (2) an individual gaming machine 10 that is associated with its own MASTERCOM 14

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<sup>117</sup> 6/22/10 Final Office Action at 2, 9.

<sup>118</sup> Application at claims 1 and 18.

<sup>119</sup> Raven at 2:30-35; 2:42-46; 2:60-63.

<sup>120</sup> *Id.* at 2:31-36.

<sup>121</sup> *Id.* at 2:60-63.

unit; (3) a computer interface unit 18; and (4) a progressive gaming system link 56, which is used for jackpots associated with progressive game play.<sup>122</sup>

For these reasons, Applicant respectfully submits that Raven's MASTERCOM 14 is not a system controller, but instead are individual control units used by each gaming machine 10.

**D. Conclusion**

Please charge any necessary fees, including the \$540 fee for this Appeal Brief, or credit overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

Respectfully submitted,

Date: November 10, 2010

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<sup>122</sup> *Id.* at Figure 3.

### VIII. CLAIMS APPENDIX

1. A gaming system including a system controller, a credit establishment facility, a plurality of gaming machines, a communications system connecting each of the plurality of gaming machines to the system controller, and a player identification device for association with player credit,

each of the gaming machines having

(1) a credit recording facility,

(2) a player input device,

(3) a player identification input device responsive to a player identification device; and

(4) a game controller to play a game when a player has established a credit in the credit recording facility of the respective gaming machine,

wherein the credit establishment facility includes a terminal connected to the communications system for transfer of player credits via the communication system to a selected gaming machine selected for play of a game, said terminal located remotely from the selected gaming machine and arranged to establish a player credit and to associate that credit with a player identification device of the player establishing the credit, and wherein said player credit is transferred to the gaming machine selected for play, and said player credit being held in said credit recording facility of the gaming machine selected for play, and wherein the gaming machine selected for play is locked so that the gaming machine no longer operates to play a game by any player solely when player credit held in the credit recording facility of the respective gaming machine selected for play is non-zero, and via player action unlocked so that the gaming machine selected for play operates to play a game when the gaming machine selected



for play is supplied via the identification input device with the player identification device associated with the player credit held in the credit recording facility of the respective gaming machine.

2. The system as claimed in claim 1, wherein the selected gaming machine connected to the system includes a reservation button, and wherein actuation of said reservation button locks said selected gaming machine from play.

3. The system as claimed in claim 44, wherein said actuation of said reservation button occurs while the player tracking device is received by said player identification input device.

4. The system as claimed in claim 1 wherein a gaming machine connected to the system includes a timeout device, and wherein when the machine is locked for more than a predetermined time any credit held in the credit recording facility of the machine is transferred to the system controller and held there for the player and the machine is unlocked to allow another player to establish a credit in the credit recording facility of the machine and to commence play.

5. (Cancelled).

6. The system as claimed in claim 1 wherein the player credit established by the credit establishment facility and associated with a player identification device of a player establishing the credit is held in the system controller.

7. The system as claimed in claim 6, wherein each gaming machine connected to the system includes a credit importing facility such that when a player identification device is supplied to a gaming machine that is not currently holding a player credit in its credit recording facility and is unlocked, the gaming machine will signal the system controller to transfer the players credit of

the player supplying the player identification device to the credit recording facility of the respective gaming machine.

8. The system as claimed in claim 7, wherein the player credit held in the system controller is transferred to the credit recording facility of the machine selected by the player when the player inserts the associated player identification device into the player identification input device of the selected machine.

9. The system as claimed in claim 1, wherein the player identification device is a token.

10. The system as claimed in claim 9, wherein the token is a magnetic stripe card.

11. The system as claimed in claim 9, wherein the token is a smart card.

12. The system as claimed in claim 9, wherein the token is issued by a gaming establishment as an in-house identification mechanism.

13. The system as claimed in claim 9, wherein the token is a financial transaction card issued by a remote financial institution.

14. The system as claimed in claim 9, wherein the token is a ticket readable by an acceptor mounted within the gaming machine.

15. The system as claimed in any one of claims 1, wherein player identification input device is a bio-sensor input device and the player identification device is a physical attribute of the player.

16. The system as claimed in claim 15, wherein the player identification input device is a fingerprint reader and the player identification device is a fingerprint of the player.

17. The system as claimed in claim 15, wherein the player identification input device is an iris scanner and the player identification device is an eye of the player.

18. A gaming machine for connection to a gaming system wherein the gaming system comprises a system controller, a plurality of gaming machines, and a communications system connecting each of the plurality of gaming machines to the system controller, the gaming machine comprising

(1) a credit recording facility,

(2) a player input device,

(3) a tracking input device responsive to a player tracking device, and

(4) a game controller arranged to play a game when a player has established a credit in the credit recording facility of the gaming machine,

wherein one gaming machine of the plurality of gaming machines is locked so that the one gaming machine no longer operates to play a game by any player, solely at a time when player credit held in the credit recording facility of the one gaming machine is non-zero, and automatically unlocked to allow play when a player tracking device is afterward supplied to the tracking input device of another gaming machine, and credit associated with the credit held in the credit recording facility of the one gaming machine is automatically transferred to the credit recording facility of the other gaming machine in response to the player tracking device being supplied to the tracking input device of the other gaming machine.

19. The gaming machine as claimed in claim 18, which includes a reservation button; and wherein said player action includes actuation of said reservation button.

20. The gaming machine as claimed in claim 19, wherein the reservation button is actuated

while said player tracking device is received by said tracking input device.

21. (Cancelled).

22. The gaming machine as claimed in claim 18 wherein a player credit is established by a credit establishment facility and associated with a player tracking device of a player establishing the credit, said player credit to be held in the system controller.

23. The gaming machine as claimed in claim 22, includes a credit importing facility such that when a player tracking device is supplied to a gaming machine that is not currently holding a player credit in its credit recording facility and is unlocked, the gaming machine will signal the system controller to transfer the player's credit of the player supplying the player tracking device to the credit recording facility of the respective gaming machine.

24. The gaming machine as claimed in claim 23, wherein the player credit held in the system controller is transferred to the credit recording facility of the machine selected by the player when the player inserts the associated player tracking device into the tracking input device of the selected machine.

25. The gaming machine as claimed in claim 18 wherein the player tracking device is a token.

26. The gaming machine as claimed in claim 25, wherein the token is a magnetic stripe card.

27. The gaming machine as claimed in claim 25, wherein the token is a smart card.

28. The gaming machine as claimed in claim 25, wherein token is issued by a gaming establishment as an in-house identification mechanism.

29. The gaming machine as claimed in claim 25, wherein token is a financial transaction card issued by a remote financial institution.

30. The gaming machine as claimed in claim 25, wherein the token is a ticket readable by an acceptor mounted within the gaming machine.

31. The gaming machine as claimed in claim 18 wherein tracking input device is a bio-sensor input device and the player tracking input device is a physical attribute of the player.

32. The gaming machine as claimed in claim 31, wherein the tracking input device is a fingerprint reader and the player tracking device is a fingerprint of the player.

33. The gaming machine as claimed in claim 31, wherein the tracking input device is an iris scanner and the player tracking device is an eye of the player.

Claims 34 — 43 (Cancelled).

44. The system as claimed in claim 2, wherein said player action further includes use of said player identification device.

45. The system as claimed in claim 2 wherein said player action includes removal of said player identification card from said player identification device.

46. The gaming system of claim 1 wherein the selected gaming machine is locked to prevent play when credits are transferred by said terminal prior to the selected gaming machine being supplied with the player identification device.

47. The gaming system of claim 1 wherein the gaming system detects whether the selected

gaming machine is in use prior to the transfer of the player credit to the selected gaming machine.

48. The gaming system of claim 1 wherein the gaming system does not allow the transfer of player credits to proceed if the selected gaming machine is in use.

49. The gaming system of claim 1 wherein said terminal is a cashier's terminal operable by a cashier.

50. The gaming system of claim 1 wherein said terminal is cash in/cash out terminal operable by the player.

## **IX. EVIDENCE APPENDIX**

- Exhibit A: U.S. Pat. No. 5,429,361 (Raven), entered into record by Examiner in the May 28, 2005 Non-Final Office Action.
- Exhibit B: U.S. Patent No. 5,954,583 (Green), entered into record by Examiner in the April 1, 2009 Final Office Action.
- Exhibit C: U.S. Patent Application Publication 2003/0220138 (Walker Publication), entered into record by Examiner in the May 28, 2005 Non-Final Office Action.
- Exhibit D: U.S. Patent No. 6,638,169 (Wilder), entered into record by Examiner in the April 1, 2009 Final Office Action.
- Exhibit E: U.S. Patent No. 7,107,245 (Kowalick), entered into record by Examiner in the April 1, 2009 Final Office Action.
- Exhibit F: U.S. Patent No. 6,634,942 (Walker), entered into record by Examiner in the September 15, 2009 Non-Final Office Action.
- Exhibit G: U.S. Patent No. 5,265,874 (Dickenson), entered into record by Examiner in the May 28, 2005 Non-Final Office Action.
- Exhibit H: U.S. Patent No. 6,916,244 (Gatto), entered into record by Examiner in the June 22, 2010 Final Office Action.

**X. RELATED PROCEEDINGS APPENDIX**

No decisions have been rendered in connection with the appeals of related of Application Nos. 11/441,315 and 11/754,065. Applicants are unaware of any other related appeals or interferences.



**EVIDENCE APPENDIX**  
**EXHIBIT A**

# United States Patent [19]

Raven et al.

[11] Patent Number: 5,429,361

[45] Date of Patent: Jul. 4, 1995

## [54] GAMING MACHINE INFORMATION, COMMUNICATION AND DISPLAY SYSTEM

[75] Inventors: Richard Raven; Thomas Miner; Jay Stone, all of Reno, Nev.

[73] Assignee: Bally Gaming International, Inc., Las Vegas, Nev.

[21] Appl. No.: 763,924

[22] Filed: Sep. 23, 1991

[51] Int. Cl.<sup>6</sup> ..... A63F 9/24

[52] U.S. Cl. .... 273/138 A

[58] Field of Search ..... 273/138 A, 143 R, 138 R, 273/85 CP, 85 G, 434, DIG. 28, 269; 364/410, 412

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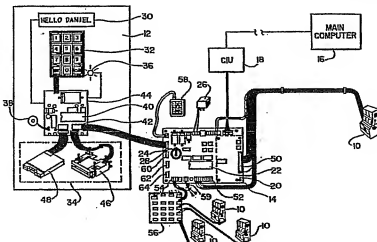
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Primary Examiner—Jessica J. Harrison  
Attorney, Agent, or Firm—Jenner & Block

## [57] ABSTRACT

An information and communication system permits communication between gaming machines and a central control system and between a player or operator and a central control system. The system includes a central data processor, a control unit for each gaming machine within the system which is in communication with the central data processor and a user interface which includes a keypad, a card reader and a display. A user interface is secured to each gaming machine and operatively connected to the control unit. The keypad can be used by a player or operator to transmit information to the central data processor. The control unit can be used to identify special players and transmits messages, including promotional messages, for display. The control unit includes memory which contains personality data for the gaming machine and can be used to transmit the personality data from the user interface to its memory. The control unit can accept personality data from a card inserted into the card reader and can be enabled by a personal identification number entered on the keypad. The system provides multiple features including automated maintenance, game accounting, security, player tracking, event tracking, employee/player interaction from the game to the central data processor, cashless operation of gaming machines, reserving gaming machines and other functions.

28 Claims, 2 Drawing Sheets



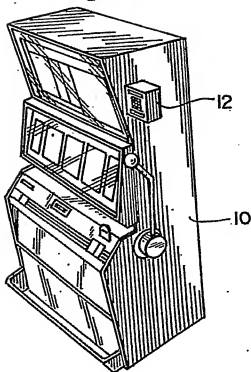
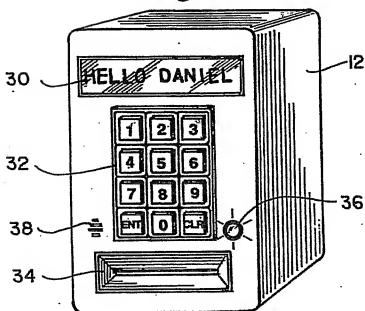
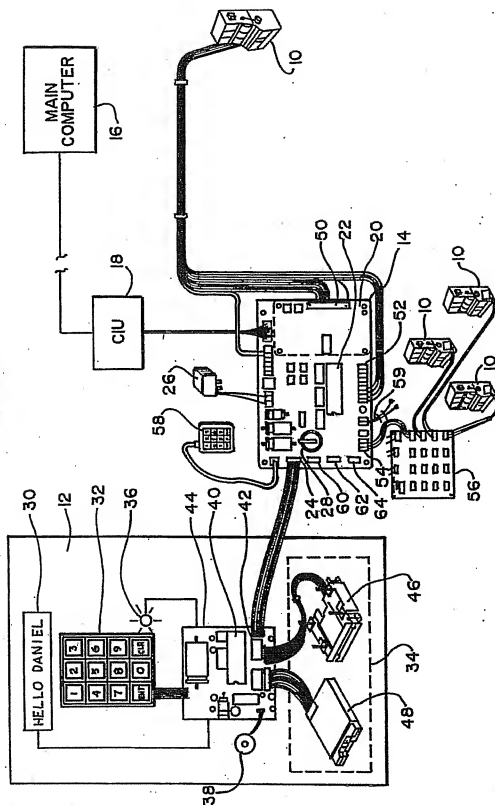
**Fig. 1****Fig. 2**

Fig. 3



# GAMING MACHINE INFORMATION, COMMUNICATION AND DISPLAY SYSTEM

## TECHNICAL FIELD

The invention relates to the field of amusement and gaming machines, and in particular to a method and system for permitting such gaming machines to communicate with a central control system, allowing the player or operator to communicate with the system, and permitting cashless operation of such gaming machines.

## BACKGROUND OF THE INVENTION

Gambling casinos and other establishments often have large numbers of individual gaming machines, such as slot machines and video gaming machines. For some time it has been desirable to automate accounting, security and other functions related to such machines for efficiency, reliability and economy. Data transfer systems for providing accounting and security information to casino operators have been described in U.S. Pat. Nos. 4,072,930, 4,283,709 and 4,636,951. The systems known in the art, however, have been principally directed toward reporting data from the gaming machines to the central computer, and have not provided for transmission of data from the central computer to the individual machines. Further, such systems have not provided any means by which a player or employee can communicate with the system. Another disadvantage of these systems is that their functions have been very limited, primarily for reporting accounting data to the central computer.

In the past it has not been possible for a player to interrupt his play, leave the machine briefly, and then return and resume play. It is desirable to provide a reservation feature so that a player can temporarily reserve a machine.

It is also desirable to permit cashless gaming so that the player does not need to carry large sums of cash or obtain change in different denominations for the different machines he wishes to play. A gaming system using credit cards wherein approval and credit is provided by a remote financial institution is disclosed in U.S. Pat. No. 5,038,022. However, that system does not permit winnings to be credited directly to a player's card or account, and contemplates the involvement of a third-party bank or other financial institution.

## SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide a system for automating maintenance, accounting, security, player tracking, event recording and other functions for a plurality of gaming machines.

It is a further object of the invention to provide a system including display and data entry means which permit the player or employee to interact with the system.

It is a further object of the invention to provide a cashless gaming system in which the player may play a plurality of gaming machines using a single card in lieu of cash, and his winnings may be directly credited to his card.

It is a further object of the invention to provide a means for a player to temporarily reserve a gaming machine.

It is another object of the invention to provide a signal to casino personnel to identify special players.

It is yet another object of the invention to provide for the downloading of data from the central data processor to the individual gaming machines.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a gaming machine;

FIG. 2 is a perspective view of the display, multiple card reader and keypad unit for use on each gaming machine in the system;

FIG. 3 is a functional block diagram of the system of the invention.

## DETAILED DESCRIPTION OF THE INVENTION

### SYSTEM HARDWARE AND OPERATION

The system of the invention provides multiple features including game accounting, security, maintenance, player tracking and employee/player interaction from the game to the computer. The gaming machine 10 shown in FIG. 1 includes the present invention which provides these functions and features. The system of the invention is designed to be flexible and compatible with existing gaming machines and systems. FIG. 2 shows the display, multiple card reader and keypad (DMK) unit 12 which is mounted on the cabinet of the gaming machine 10 of FIG. 1. The DMK 12 is the only portion of the system accessible to the player.

As shown in FIG. 3, the primary hardware elements of this system are a control unit called the MASTERCOM 14; a DMK unit 12; and a main computer 16. A MASTERCOM 14 is required for each gaming machine 10 in the system, and a DMK unit 12 is needed for each gaming machine 10 for which the display, card reader and employee/player communications features are desired.

The main (or host) computer 16 may be a personal computer, for example, an IBM RT class or compatible, or a minicomputer such as a DEC 1184 or IBM RISC 6000, depending on the size of the installation and the number of gaming machines. The main computer 16 may also consist of two or more such computers linked together. The main computer 16 is located remotely in the casino, preferably in a secured area, and communicates with the MASTERCOM units 14 via a computer interface unit (CIU) 18.

The term MASTERCOM is derived from its functions: Maintenance, Accounting, Security, player Tracking, Event Recorder, Communicator. In the preferred embodiment, the MASTERCOM 14 is contained on a single circuit board 20 which has a microprocessor or microcontroller 22 such as the Motorola MC68HC705C8 microcontroller. The board 20 also contains memory including random access memory (RAM) and some form of read-only memory (ROM), such as EEPROM. Typically, a 128-byte EEPROM may be used for storing game personality data, and a 32-byte EEPROM may be used for storing the accounting meters. The MASTERCOM 14 is connected to the DMK 12 via a serial port 24. The MASTERCOM board 20 is fairly compact (on the order of 4.5x6.5 inches) and may be conveniently located inside the gaming machine cabinet 10. The MASTERCOM 14 is powered by an external power supply 26. A 10-year lithium battery 28 is provided to back-up the RAM.

The DMK 12 is the interface and communications device between a player or employee and the MASTERCOM 14. The DMK unit 12 may be mounted

directly in the gaming machine cabinet 10 or attached to an existing cabinet as shown in FIG. 1. As shown in FIG. 2, the DMK 12 houses a 12-character dot-matrix LED display 30, a 12-key user interface keypad 32, and a combined magnetic/smart card reader 34. In the preferred embodiment shown in FIG. 2, it also includes a three-color LED 36 for special customer identification, and a small sound module 38 for alerting the player to an important message. Like the MASTERCOM 14, the DMK 12 is controlled by a microprocessor 40, using, for example, a Motorola MC68HC705C8S. The DMK 12 receives power from the MASTERCOM 14. The microprocessor 40 and related circuitry are mounted on a small circuit board 44. The keypad 32 and display 30 may be mounted on the reverse side of the circuit board 44 to save space.

The personality stored in EEPROM is a list of variable parameters containing addresses, coin denomination, limits and characteristics that vary from one gaming machine and/or casino to another. The MASTERCOM 14 and its microprocessor 22 will not function properly unless a valid personality has been installed. On power up, reset and at periodic intervals, the MASTERCOM 14 will test the personality in the EEPROM and determine if it is valid by looking at the check sum. If the personality is invalid (bad check sum) or none exists, the MASTERCOM will display a flashing "EMP CARD" on the DMK 12 and will halt communications with the main computer 16. Only after the problem has been corrected and at least the MASTERCOM 14 address has been entered will the MASTERCOM 14 resume communications with the main computer 16. The address is a four digit number which is converted to a two digit hexadecimal address for the MASTERCOM. This is the address used by the main computer 16 to communicate with the particular MASTERCOM 14 via the CIU 18.

Once an employee card has been inserted into the card reader 34 in response to the "EMP CARD" prompt, the DMK 12 will display a prompt with "ADDR.xx" so the employee can immediately enter the personality, beginning with the address, or can command the main computer 16 to download the personality. To manually enter the personality, the employee begins by entering four digits which are the ASCII equivalent of the two digit hexadecimal address as shown in the following table:

HEX.	HEX TO ASCII CODES			
	ASCII	HEX	ASCII	
0	30	8	38	
1	31	9	39	
2	32	A	41	
3	33	B	42	
4	34	C	43	
5	35	D	44	
6	36	E	45	
7	37	F	46	

After the address has been entered, the display 30 will prompt the employee to enter other variables serially, for example, COIN (coin type), MXIN (maximum coin in), etc.

The following elements of the MASTERCOM personality, or operating parameters, may be casino-defined and changed as needed via the DMK keypad 32 as explained in more detail below:

1) Machine system address

- 2) Machine Paid Jackpot Notification—the minimum size of a machine paid jackpot (in coins) which will produce an exception code (63), which will produce a special change booth message notifying casino personnel of the jackpot so they can refill the machine's coin hopper.
- 3) Maximum coin in—used by MASTERCOM to verify the jackpot amounts
- 4) Maximum jackpot number—used in games which communicate serially with the MASTERCOM to define which jackpot codes will be received from the game.
- 5) Progressive Jackpot Table—a list of which progressive jackpot IDs may be hit on this game.
- 6) Maximum number of progressive jackpots (available on this game)
- 7) Minimum number of coins per handle pull required for "Hot Handle"—many games permit multiple coins to be played in a single game, i.e., on one handle pull in a slot machine. If a player repeatedly plays multiple coins, the "hot handle" designation will apply.
- 8) Number of Handle Pulls for "Hot Player"—number of hot handles needed to generate a hot player message
- 9) Period of time for Hot Player—the amount of time a player has to accumulate the required number of hot handle pulls
- 10) Reset Time for Hot Player—the amount of time between handle pulls (no play activity) before the Period of Time for Hot Player is reset.
- 11) Service Button Delay—period of time before a service message is sent; message is sent only if employee has not serviced player and canceled message;
- 12) Disable Service Button—length of time between enabling service request messages.
- 13) Time for Employee Card—length of time before producing an abandoned card message for an employee card.
- 14) Time for Player Card—length of time before producing an abandoned card message for a player card.
- 15) Starting Amount of Bonus Point Countdown—the reset value for the countdown display; the countdown resets to this value when a different player card is inserted into the card reader or a countdown cycle has occurred.
- 16) Bonus Point Amount Earned for Each Countdown Cycle—the award amount may be of any multiple or percentage desired.
- 17) Number of Coins per Bonus Point—the number of coins in required to earn x number of bonus points.
- 18) Number of Coins per Countdown Amount—the number of coins in required to reduce the countdown amount by x amount.

The personality also contains information for other casino-defined functions, such as the service requests discussed below and the definition of the colors on the three-color LED 36 for indicating special players.

The DMK 12 receives three types of input data: card data read from a card inserted by either a player or employee; keypad entry data from either a player or employee; and display commands from the MASTERCOM 14. The DMK 12 transmits three kinds of data directly to the MASTERCOM 14: card data read from the card reader 34; keypad entry data from the keypad

32; and display command data to inform the MASTERCOM 14 that the DMK 12 is processing the display command that was sent to it. Data is transmitted to and from the MASTERCOM using the Serial Peripheral Interface (SPI) 42. The DMK's SPI 42 is set up as a slave device. The DMK 12 can receive data at a maximum rate of 2.1 Mhz, which has been found to be sufficient for the intended purposes.

The display 30 consists of 12 alphanumeric characters with associated firmware for control. The firmware controls and provides timing and sequencing for the SPI 42, card reader 34, keypad 32 entry, and characters or words displayed. The display 30 receives the various display commands via the SPI 42 from the MASTERCOM 14.

The message types include the following: (1) ROM scrolled message—A message stored in ROM is continuously scrolled across the display 30 when the MASTERCOM 14 is in the "attract" mode, i.e., when the game is not being played or serviced. (2) Down-loaded RAM messages—Special messages such as promotional messages or current sports scores may be downloaded from the system and displayed; (3) Jackpot amount; (4) Hand pay jackpot amount; (5) LED 36 or sound unit 38 control; (6) Bonus information—A player may earn bonus or frequent player points by spending a predetermined amount; (7) Bad communications—messages indicating problems with communicating with the system; and (8) 8- or 12-digit fixed word messages.

The DMK 12 receives several types of display messages from the MASTERCOM 14. The message types are single byte commands, multi-byte commands, and down-loaded messages. The D0-type message is actually a two-byte message: D0 plus a display command byte, which informs the DMK 12 what to display. Some types of display commands are ROM scroll, STANDBY, TRANSMIT, INVALID, etc., each represented by a hexadecimal code.

The D1-type message is a multi-byte message as shown in the following table:

Byte No.	Message Data
1	Message type (D1 HEX)
2	Message Length (HEX, excluding check sum)
3	Display command (HEX)
4 - n	Message (ASCII)
n + 1	Check sum

The message length is the number of bytes in the message plus one for the display command. The display command byte informs the DMK 12 the format in which to display the message. The display commands include employee card sequence, bonus points, jackpot with amount, hand paid jackpot with amount, and employee keypad entry prompts. The check sum is the two's complement sum of all the bytes of the message.

There are three basic types of downloaded messages: promotional, sports and player reply. Promotional messages include notices of special events in the casino, special rates and the like. Sports messages give scores of current sporting events for the player's information and entertainment. Player reply messages request the player to enter some requested information.

In addition to the messages sent by the MASTERCOM 14, a poll is sent to the DMK 12 every 100 msec. A poll is a single byte command (80 HEX). After the poll is sent, the DMK 12 should reply with one of three types of messages: status, keypad or card data. The

status message is a three-byte message consisting of the following bytes: ASCII S, current display status and current card status. If the display status is not the same as the MASTERCOM's, then the MASTERCOM 14 will retransmit the current display message. After ten tries, the MASTERCOM 14 will reset the DMK 12.

The keypad message is a single-byte message containing the key code of the key pressed. The card data message is a 9-byte message as shown in the following table:

Byte No.	Message Data
1	Message type (C1-C8 HEX)
2	Message length (6 HEX, excludes check sum)
3-8	Card data (6 HEX bytes)
9	Check sum

The message type sent to the MASTERCOM 14 indicates card status as set forth in the following table:

Code (HEX)	Definition
C1	Good card read with 6 data bytes
C2	Card completely out
C3	Bad card read
C4	No data on card coming out
C5	No data on card coming in
C6	Card is coming out
C7	Rear sensor seen without front sensor
C8	Timeout on card going in or coming out

The message length is always 6 bytes. The card data contains player or employee information that is stored on the card. The check sum is the two's complement sum of all the bytes in the message.

In the preferred embodiment, the card reader 34 is a combined magnetic and smart (memory) card reader, for example, a combination of the Tatsumo smart card reader 46 and a Neuron magnetic card reader 48. This permits the system to accept both types of cards. Although the magnetic card alone is sufficient for many system functions, the smart card by virtue of its on-board memory permits additional functions, and is especially useful in cashless gaming as described in more detail below.

The magnetic card reader 48 accepts bit stream data from an inserted magnetic card. Four inputs are used to detect the data and card position: front card sensor, rear card sensor, data strobe and data. The data bits are taken in bit by bit on each data strobe input and stored in contiguous memory. There are four records encoded on track 1 of the magnetic stripe of either 15 or 16 character lengths. Each record is preceded by two bytes of zeroes (0) followed by one or two START sentinels (\$45, 12 DATA characters, one STOP sentinel (\$1F) and a LRC. The LRC is the exclusive OR'd result of all characters from the START sentinel through the STOP sentinel. Each data byte is 7 bits long with the seventh bit being an odd parity bit. This seven bit data is then converted to six (6) hexadecimal data bytes for use by the system (see table below).

The card data characters are set forth in the following table:

Byte No.	Card Data Character
1	START sentinel (\$45)
2	START sentinel

## -continued

Byte No.	Card Data Character
3	Casino ID number - MSD
4	Casino ID number - LSD
5	Employee or player code
6-10	Customer number
11-14	Customer/employee number
15	STOP sentinel (SIF)
16	LRC

The raw 7-bit card data is converted to hexadecimal as follows:

Raw 7 Bit Card Data	Converted Hex Data
100 0101	45 (START)
001 0000	0
101 0001	1
101 0010	2
001 0011	3
101 0100	4
001 0101	5
001 0110	6
101 0111	7
001 1000	8
001 1001	9
110 0001	A
110 0010	B
010 0011	C
110 0100	D
010 0101	E
010 0110	F
001 1111	FF (STOP)

If the front card sensor only is seen, indicating card going in or stopped, a timer is started. If no rear sensor is seen after 4 seconds, a code is sent to the MASTERCOM 14 and the timer is reset. The timer is also cleared on card out.

If the rear sensor is seen, indicating card in and seated, the front sensor timer is cleared. If the front sensor has not been seen, a bad front sensor code (\$C7) is sent to the MASTERCOM 14. Otherwise, the raw card bit stream data is analyzed. If there is good data on one of the four records, a \$C1 code is sent to the MASTERCOM 14. If there is a bad card read, a \$C3 code is sent. Raw read data is cleared so the card can be read on the way out. When the rear sensor is no longer seen, indicating that the card is coming out, a \$C5 code is sent to the MASTERCOM 14.

If there is no front or rear sensor, the card is out. If there is no raw card data, a \$C4 code is sent; if there is card data, a \$C2 code is sent.

After the player inserts his card containing good data, a welcome greeting including the player's name is displayed on the display 30 of DMK 12. If applicable, his current accumulated bonus points and amounts needed to play to earn his next bonus paid will then be displayed.

The keypad 32 consists of 12 keys in a 3 by 4 matrix, including the digits 0 through 9, "CLR" (clear) and "ENT" (enter). The keypad 32 is polled every 10 msec. Keypad entries are verified for valid keypad entry by the DMK 12 and then passed directly to the MASTERCOM 14. The keypad codes sent to the MASTERCOM 14 are as follows:

Code	Key or key combination
11	0
1	1

## -continued

Code	Key or key combination
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	CLR (Clear)
12	ENT (Enter)
13	CLR + ENT (backspace)

The player may use the keypad 32 to enter his PIN and credit requests for cashless gaming as described below. The player may also use the keypad 32 to request cocktail service, change, or machine service, or to reserve the machine 10. The codes may vary, but may be, for example, 1+ENT for cocktail service, 2+ENT for change, 3+ENT for service, and 4+ENT to reserve the machine 10. Entering the code for cocktail service, change or machine service will send a signal to the system to notify the appropriate employee to respond. The reservation feature is an innovation which allows a player to interrupt his play and return to the machine later, resuming play where he left off. Upon entry of the reservation code, a timer is started and the machine enters the reserved mode in which no other player may use the game. The player then removes his card and may leave the machine. When the player who reserved the game reinserts his card, play may resume. If the player does not return in a predetermined length of time, e.g., 10 minutes, the reservation feature times out and the game returns to the attract mode. The reservation mode may also be canceled by insertion of an employee card into the card reader 34. An employee may also invoke the reservation feature without a time limit.

An employee may use the keypad 32 for a variety of functions not available to players. A valid employee card inserted into the card reader 34 will enable employee keypad entries. The DMK 12 will first display the following series of status messages:

Display	Definition
ADDR XX	MASTERCOM Address
EXCD XX	Last exception code sent to MASTERCOM
BET XXXX	Last game - amount bet
PAY XXXX	Last game - amount paid
PER# MST1001	Program (personality) identification

Upon completion of the sequence, the DMK will prompt with a display of "MODE 00." The sequence may be aborted at any time before reaching MODE 00 by depressing any key on the keypad 32. Removal of the employee card from the card reader 34 will terminate the operational mode routine and return the DMK 12 to normal system operations. The MODE 00 display is the normal entry point for execution of employee operations. The employee enters the desired command and then presses ENT to start the operation. The employee commands are READ PERSONALITY MODE (01), ALTER PERSONALITY MODE (02), TEST MODE (03) and "911" EMERGENCY/MESSAGE TRANSMISSION MODE (91).

The READ PERSONALITY MODE allows the employee to review the personality of the MASTER-



COM 14 for a given game. As previously discussed, the personality is a list of variable parameters containing addresses, coin type, limits and characteristics that vary from one game and/or casino to another. The MASTERCOM 14 will not function properly unless a valid personality has been installed. An employee may select READ PERSONALITY MODE directly without authorization from the main computer 16. This mode only allows the employee to review the data without making any changes. By repeatedly pushing the ENT key, the employee can step through each line of personality data. If no personality is installed, or if the personality is invalid, an appropriate message will be displayed.

To enter the ALTER PERSONALITY MODE, the employee must obtain authorization from the main computer 16. This security device prevents unauthorized tampering with the game personality. Once cleared by the main computer 16, the employee may then step through the lines of data using the ENT key, and may enter changes using the keypad 32. The employee may also cause a new personality to be down loaded from the main computer 16.

The TEST MODE causes a self test routine to execute and to report on the display any system problems or errors. In the TEST MODE, all signals received by the MASTERCOM 14 are displayed to insure proper operation of all inputs. The test routine looks at certain flags in the MASTERCOM 14 and displays the trigger status of the discrete inputs as the employee triggers the discrete devices. The exact tests will vary depending on the type of machine personality. The test mode may be selected without main computer 16 authorization.

The EMERGENCY 911 MODE allows an employee to quickly send a request for emergency assistance to casino security in case of a medical or other emergency. The exact location of the game on the casino floor (based on its address) will instantly be provided to security personnel, facilitating a quick response. To enter this mode, the employee will insert his card and at the prompt MODE 00 will enter "911"+ENT. This will transmit an exception code (24) to the main computer 16, requesting that help be sent to the location of the MASTERCOM/DMK. The display 30 will then show "TRANSMIT" to let the employee know the exception code 24 has been transmitted. After the MASTERCOM 14 receives acknowledgement of the transmitted code from the main computer 16, the display 30 will show the message "HELP IS . . . COMING." This display will remain until the employee card is removed.

Other modes which may be provided include an ENTRY mode, in which a two-digit code is displayed to indicate the reason of entry into the game 10, i.e., a door open condition. It is important for a casino operator to keep track of reasons for entry into the game for security and regulatory reasons. In the WORK ORDER mode, an automatic work order is sent to the casino's repair shop when a game is placed out of service.

As previously mentioned, in the preferred embodiment a multi-color LED 36 is provided on the DMK 12. This LED 36 is lighted to indicate to casino personnel that a special player, e.g., a "high roller" or "VIP" is playing the game, and may be worthy of special treatment. The criteria for each color may be defined by the casino, and may be based on data stored on the player's card as well as the amount being played.

As shown in FIG. 3, each MASTERCOM 14 communicates with the main computer 16 via the CIU 18 using balanced line serial communications. Up to approximately 125 or more MASTERCOM units may be hung on a single line, and in a large casino the line may be many hundreds of feet long with.

The MASTERCOM 14 interfaces with the gaming machine 10 by direct wire and/or RS/232 communications 50. Adapters in the form of piggyback circuit boards may be used to interface the MASTERCOM 14 with various types of gaming machines from different manufacturers. The MASTERCOM provides multiple door interfaces 52 for the game, drop, electronic security and auxiliary doors on the gaming machine 10. The MASTERCOM 14 also provides a port 54 for a progressive gaming system link 56.

An optional handheld keypad and display unit 58 is provided for the convenience of employees. This may be especially useful if a DMK unit is not available on a particular gaming machine or is out of service.

A lockout connector 59 is also provided on the MASTERCOM 14. By connecting the MASTERCOM 14 to the coin mechanism of the gaming machine 10, it is possible to lockout, or reject, all coins inserted into the machine.

The MASTERCOM 14 also provides additional high-speed serial ports 60, 62 and 64 for options such as a bill changer interface, a ticket dispenser interface, or cashless gaming control. The bill changer allows the machine to accept currency in addition to coins. The ticket dispenser may be used for various purposes, such as to print a jackpot slip for a hand pay jackpot which can be taken to the cashier at the player's convenience, or to dispense bonus tickets for certain levels of play which may be redeemed in the casino for prizes.

#### CASHLESS GAMING

An important benefit of the invention is the capability to easily provide completely cashless gaming in several different possible formats. Among the advantages of cashless gaming are that the player need not carry large amounts of cash or obtain change in the correct denominations for each type of machine he wishes to play.

In one embodiment including the cashless gaming feature, a magnetic (credit) card is used. The operating procedure for this "cashless" or "credit card" gaming is as follows. The player inserts his magnetic card into the magnetic 48 or combined magnetic/smart 34 card reader in the DMK 12. Upon detecting the insertion of the card, the DMK 12 will prompt the player by means of the display 30 to enter his personal identification number (PIN) via the keypad 32. After the PIN is entered, the DMK display 30 will ask the player to enter the credit amount desired to be used on the game. The player will enter this amount via the keypad 32. The PIN and credit amount are transmitted to the system for verification (either at a financial institution or at the casino, depending upon the issuer of the magnetic card). If a correct PIN and valid amount have been entered, the main computer 16 will return an authorization amount and a code to the MASTERCOM 14, and the verified amount will be shown on the display. As play proceeds, the credit balance will be updated and displayed in dollars and cents on the display 30.

For convenience, in the preferred embodiment the minimum and maximum amount of credit permitted on each request will be a function of the game denomination. For example, a one roll coin equivalent may be

used as the minimum, and five rolls may be used as a maximum. For a quarter (25 cent) machine, one roll of quarters equals \$10.00, so the minimum credit request would be \$10.00 and the maximum would be \$50.00, with amounts in between in \$10.00 increments.

Once the credit amount has been verified, the player can proceed with game play. On gaming machines already equipped with credit play capabilities, the player will bet using switches on the gaming machine 10 itself. On older noncredit model machines, a separate BET 10 button may be provided on the DMK unit 12. As play proceeds, the MASTERCOM logic keeps track of credits and debits, and the current balance is shown on the display. When the player is finished playing, he can check his balance on the display 30 and then remove his 15 card. Upon removal of the card, the MASTERCOM 14 will transmit the balance amount to the main computer 16, which in turn will return a message received code. The display 30 will then indicate "VERIFIED" and show the balance recorded by the system, and thereaf- 20 ter will return to the promotional display mode. The player may then proceed at his convenience to the cashier to collect his balance recorded by the system.

In another embodiment including cashless gaming, a "smart" or memory card is used. With this type of card, 25 there is limited system involvement during cashless play. The player purchases from the casino cashier or other source a smart card with a dollar amount credited to the card. This becomes in effect the player's "bank." The player inserts the card into the smart 46 or combined smart/magnetic card 34 reader, and his ID number and the bank balance are sent to the MASTER- 30 COM 14. No credit authorization is required, because the player is carrying his "bank" with him on his card. The player then plays the game in the normal manner. Each bet is subtracted (debited) from his card, and any 35 wins are added (credited) to his card. If the card balance is reduced to zero, the player must remove the card and return to the cashier to purchase more credits for the card.

The smart card is mechanically locked into place in the smart 46 or combined smart/magnetic card reader 34 upon insertion, and remains locked until the player requests removal by pushing a button. At this time, the card balance is updated, and the new balance sent to the 45 MASTERCOM 14.

A smart card may also be used in another embodiment with full system involvement. In this embodiment, the smart card is used in the same manner as a magnetic card. However, the smart card has the added security of 50 carrying the bank balance on the card, which can be cross-checked by the system upon insertion of the card into the reader. The player can request the system to increase his smart card credit amount by debiting his central bank account. This transaction will be subject to verification and approval through the system. Credit amounts can be stored on the smart card and carried from machine to machine. This is a distinct difference 55 from the magnetic card where the credit amounts are stored solely on the system. With the magnetic card, the player must request a transfer of credits from the system each time he inserts his magnetic card.

From the above discussion it is apparent that the invention provides a gaming machine system with multiple features, not only providing the casino operator 65 with extensive information for casino management, but also allowing the player and employee to interact with the system. Although the system has been described in

terms of its use with gaming machines which return money to the player, many aspects of the invention would also apply to coin-operated amusement type games.

5 A specific embodiment of the invention for use with gaming machines in a casino has been described for purposes of illustrating the manner in which the system may be made and used. It should be understood that implementation of other variations and modifications of the invention in its various aspects will be apparent to those skilled in the art, and that the invention is not limited to the specific embodiment described. It is therefore contemplated to cover by the present invention any and all modifications, variations and equivalents that fall within the true scope and spirit of the basic underlying principles disclosed and claimed herein.

#### We claim:

1. An information and communication system for use with a player controlled gaming machine comprising: a central data processor; control means located within said gaming machine for communicating between said central data processor and the gaming machine; and an interface unit, separate and additional to the gaming machine, including a keypad, a card reader and a display secured to the gaming machine and operatively connected to said control means wherein said keypad transmits player generated information to said central data processor.
2. The system of claim 1 wherein said interface unit includes means for a player to reserve the gaming machine by temporarily disabling the gaming machine thereby preventing other players from playing said gaming machine.
3. The system of claim 1 wherein said control means includes means responsive to said interface unit for identifying special players to said central data processor.
4. The system of claim 1 wherein said control means includes means for transmitting from said central data processor messages for display on said display.
5. The system of claim 4 wherein said messages include promotional messages.
6. The system of claim 1 wherein said control means includes a memory containing personality data for the gaming machine and includes transmitting means for transmitting said personality data from said interface unit to said memory.
7. The system of claim 6 wherein said transmitting means accepts said personality data from a card inserted into said card reader.
8. The system of claim 7 wherein said transmitting means is enabled by a personal identification number input through said keypad.
9. An information and communication system for use with a gaming machine comprising: a central data processor; control means located within said gaming machine for communicating between said central data processor and the gaming machine; and an interface unit including a keypad, a card reader and a display secured to the gaming machine and operatively connected to said control means, said control means include reservation means for permitting said keypad to be used by a player to reserve the gaming machine.

10. The system of claim 9 wherein the player is identified by a card inserted in said card reader and said card is reinserted to reactivate the gaming machine.

11. An information and communication system for use with a gaming machine comprising:

a central data processor;

control means located within said gaming machine for communicating between said central data processor and the gaming machine; and

an interface unit including a keypad, a card reader and a display secured to the gaming machine and operatively connected to said control means wherein said control means is responsive to a card inserted in said card reader to identify special players to said central data processor.

12. An information and communication system for use with a gaming machine comprising:

a central data processor;

control means located within said gaming machine for communicating between said central data processor and the gaming machine; and

an interface unit including a keypad, a card reader and a display secured to the gaming machine and operatively connected to said control means wherein said control means includes means for transmitting messages from said central data processor to said display.

13. The system of claim 12 wherein said messages include promotional messages.

14. An information and communication system for use with a gaming machine comprising:

a central data processor;

control means located within said gaming machine for communicating between said central data processor and the gaming machine; and

an interface unit including a keypad, a card reader and a display secured to the gaming machine and operatively connected to said control means wherein said control means includes a memory and includes means for transmitting personality data from said card reader to said memory.

15. An information and communication system for use with a gaming machine comprising:

a central data processor;

control means located within said gaming machine for communicating between said central data processor and the gaming machine; and

an interface unit including a keypad, a card reader and a display secured to the gaming machine and operatively connected to said control means wherein said control means includes cashless means which responds to a credit card inserted into said card reader for generating a request for a personal identification number to be displayed on said display; receiving a personal identification number and a credit amount from said keypad; transmitting said personal identification and said credit amount to said central data processor and displaying said amount on said display.

16. The system of claim 15 wherein a minimum and a maximum amount of said credit amount increases with the denominations of the gaming machine.

17. The system of claim 15 wherein said credit card contains a credit value and wherein said cashless means includes means for transmitting said credit value on said card to said central data processor when the card is removed from said card reader.

18. The system of claim 15 further including a credit card wherein said credit card is a smart card containing an approved credit amount and said cashless means transfers said approved credit amount to said control means for game play.

19. The system of claim 15 wherein said credit amount must be approved by said central data processor.

20. The system of claim 15 further including a credit card wherein said credit card is a smart card and said cashless means transfers a credit amount which includes the debits and credits incurred during game play to said card when said card is removed from said card reader.

21. The system of claim 15 further including a credit card wherein said credit card is a smart card and said cashless means transfers a credit amount which includes the debits and credits incurred during game play to said card when said card is removed from said card reader.

22. The reservation system of claim 21 wherein said reservation means limits the reservation of the gaming machine to a predetermined amount of time.

23. An information system for use with a gaming machine comprising:

an interface unit including a keypad, a card reader and a display secured to the gaming machine;

control means located within said gaming machine for transmitting information between said interface unit and said gaming machine wherein said control means includes reservation means for permitting a player to use said interface unit to reserve the gaming machine.

24. The system of claim 23 wherein said reservation means responds to a player card in said card reader and a signal from said keypad to reserve the gaming machine.

25. The system of claim 24 wherein the gaming machine is reserved after said player card is removed from said card reader.

26. The system of claim 25 wherein the gaming machine is unreserved when said player card is reinserted in said card reader.

27. The system of claim 23 wherein said reservation means causes the gaming machine to be unreserved after a predetermined amount of time.

28. An information system for use with a gaming machine comprising:

an interface unit including a keypad, a card reader and a display secured to the gaming machine;

control means located within said gaming machine for transmitting information between said interface unit and said gaming machine;

a light source secured to said interface unit responsive to signals from said control means to display a visible signal indicating a predetermined type of player.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT B**



US005954583A

# United States Patent [19]

## Green

[11] Patent Number: 5,954,583  
[45] Date of Patent: Sep. 21, 1999

- [54] SECURE ACCESS CONTROL SYSTEM
- [75] Inventor: Graeme Allan Green, Canberra, Australia
- [73] Assignee: COM21 Limited, Mitchell, Australia
- [21] Appl. No.: 08/969,538
- [22] Filed: Sep. 30, 1997

### Related U.S. Application Data

- [63] Continuation of application No. 08/433,341, May 5, 1995, abandoned.

### [30] Foreign Application Priority Data

Nov. 5, 1992 [AU] Australia ..... PLS700

- [51] Int. Cl.<sup>6</sup> ..... G07C 9/00; G07F 7/10
- [52] U.S. Cl. .... 463/29
- [58] Field of Search ..... 463/29, 25, 16; 364/412.1

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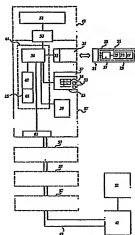
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Primary Examiner—Michael O'Neill  
Attorney, Agent, or Firm—Michael D. Bednarek; Crowell & Moring LLP

### [57] ABSTRACT

A secure access control system has a "smart" key assembly (25) with storage means (28) for storing identification data (29) and image data (30). An interface (31) provides communication between the key assembly (25) and an access control assembly (33) having a data processing assembly (44), a user interface assembly (45), a receiving slot (38) for the key assembly (25) and an identity verifier (39). The data processing assembly (44) is controlled by a central processor (34) and has data storage means (35). The user interface assembly has a keypad (36) and an LCD (37). The identity verifier (39) compares a sensed identification of a user with the image data (30) embedded in the key assembly (25).

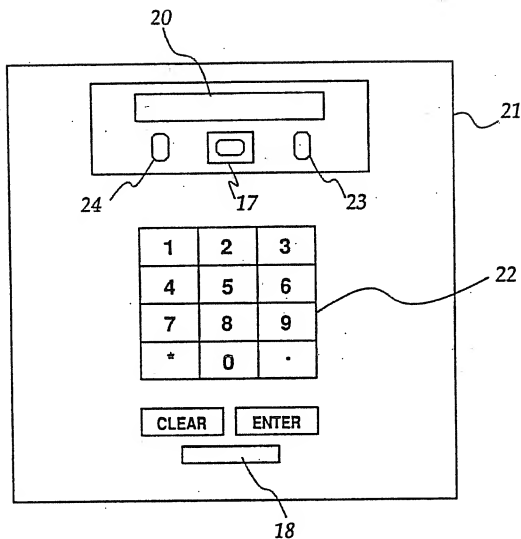
6 Claims, 13 Drawing Sheets



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*Figure 2.*



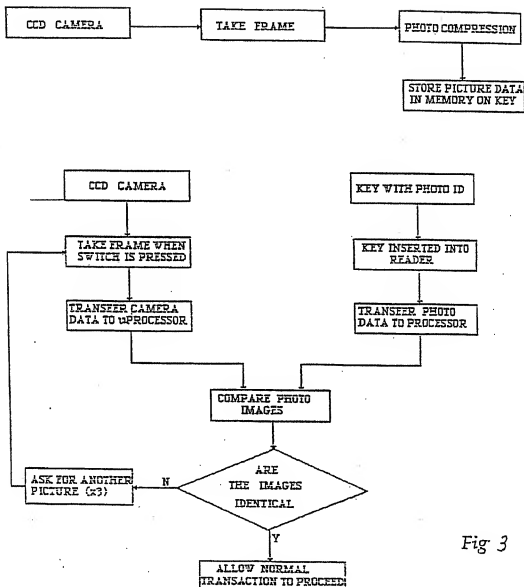


Fig 3

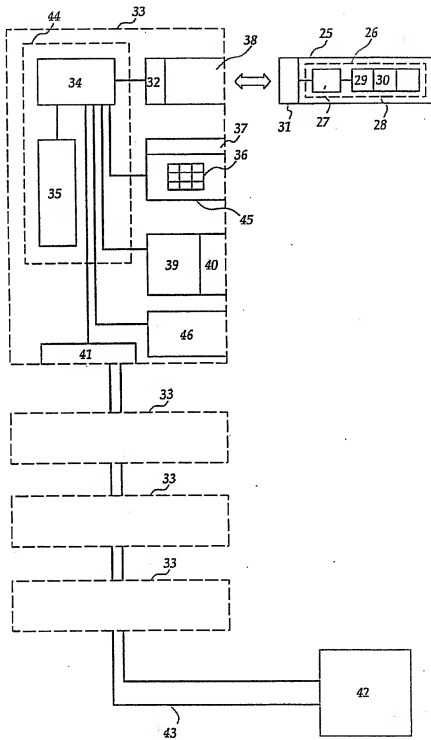


Figure 4.

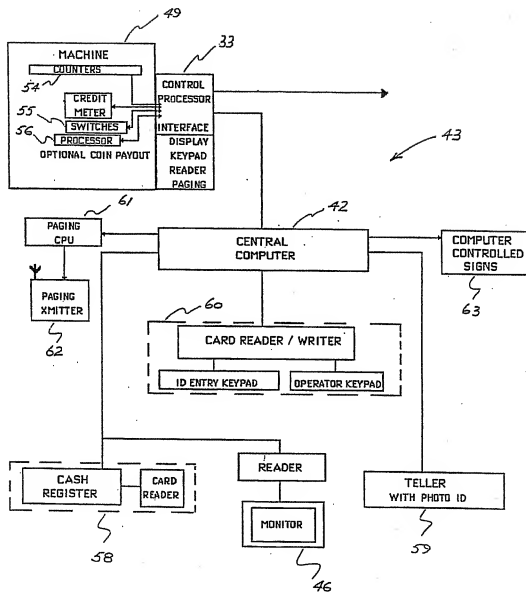


Fig 5

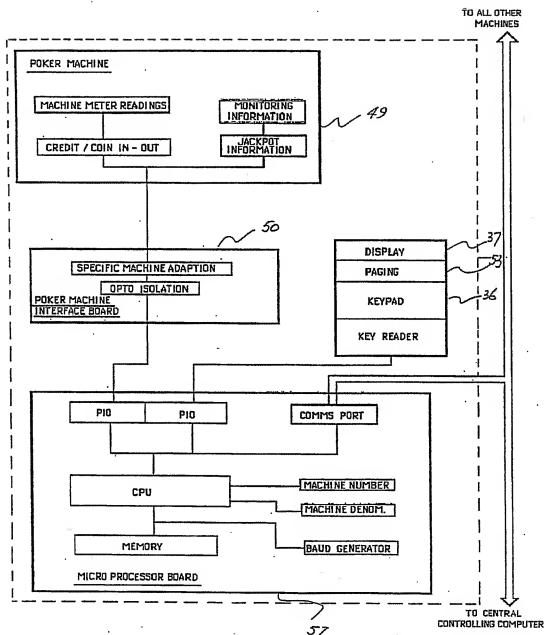
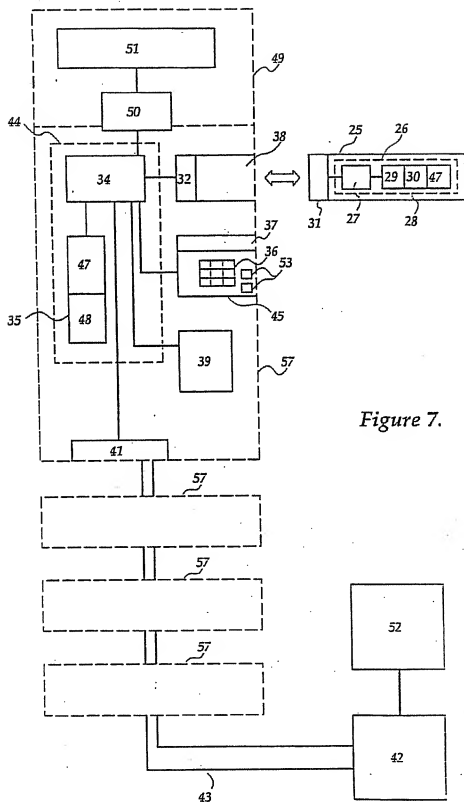
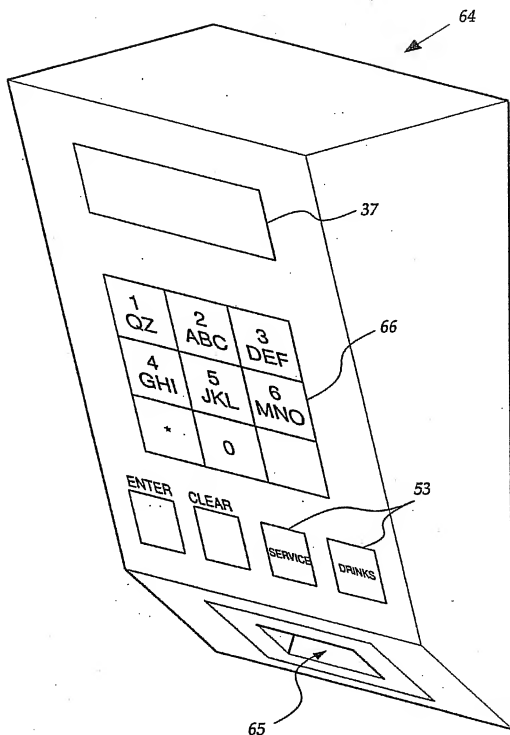
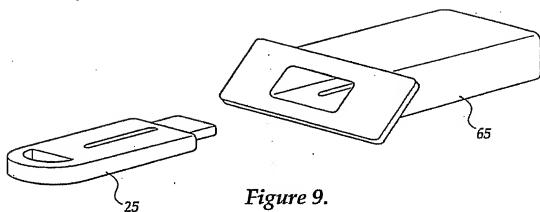
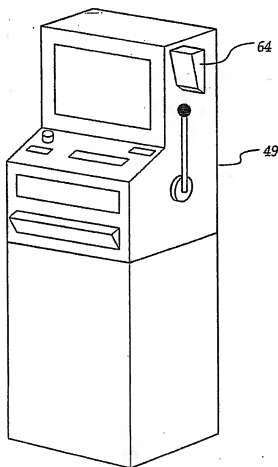


Fig 6



*Figure 8.*

*Figure 9.**Figure 10.*

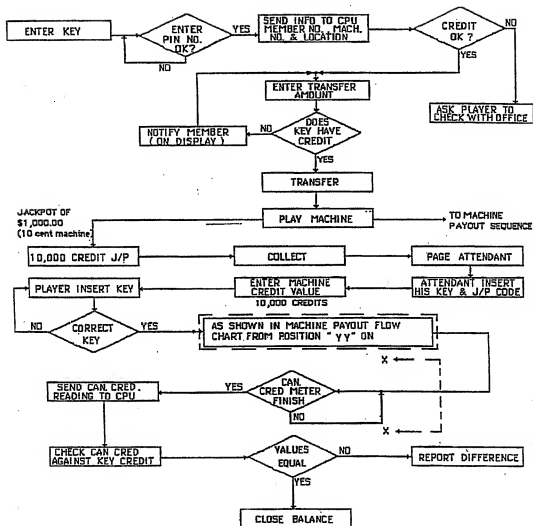
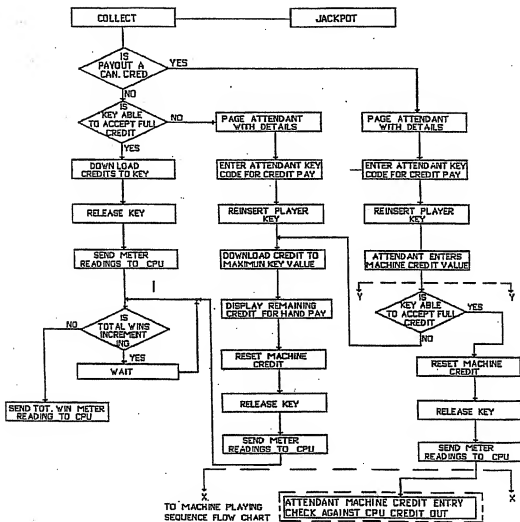


Fig 11





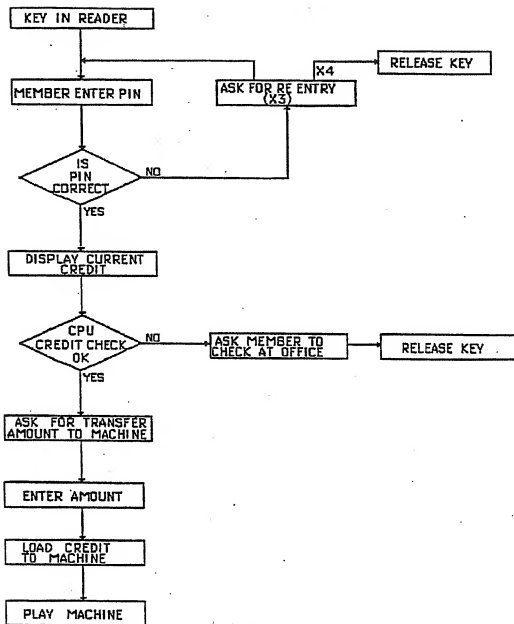


Fig 13

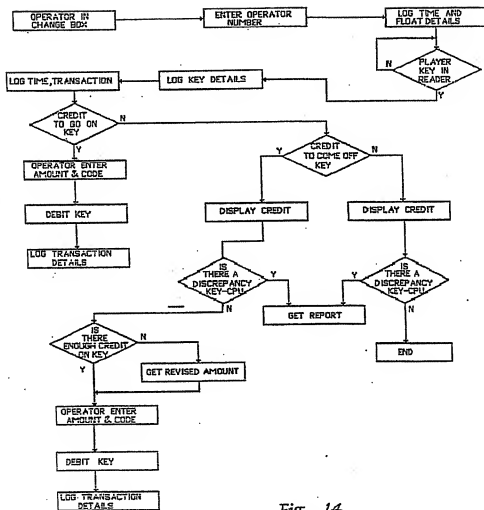


Fig 14

## SECURE ACCESS CONTROL SYSTEM

This application is a continuation of application Ser. No. 08/433,341 filed May 5, 1995, now abandoned.

## BACKGROUND OF INVENTION

This invention relates to a secure access control system.

The invention has particular but not exclusive application to a secure access control system for use in gaming establishments such as casinos and for illustrative purposes reference will be made herein to such an application. However it is to be understood that this invention can be used in many other applications, such as for example restricted area security, automatic teller machines, medical records, information retrieval etc, where control of access to only authorised users is important.

## DESCRIPTION OF THE PRIOR ART

Secure access control systems are well known. It is known to provide mechanical and electronic locks or access barriers which are "releasable" when a personal identification number (PIN) is entered on a keypad by a user or when operated by use of an encoded card or key.

It is known to use such cards in conjunction with a PIN to provide access only to authorised users who can enter the correct PIN. These known secure access systems provide access to remote sites and are controlled by a centralised computer system. However if the centralised computer is inoperable at any time, the remote site facility is also inoperable.

It is also known to provide identification cards or security access devices which include memory and circuitry enabling the memory to be read from, written to or otherwise modified. Such cards can include electrically erasable programmable read only memory (EEPROM) and are known in the art as "smartcards". Such devices are disclosed in U.S. Pat. Nos. 4,675,516, 4,725,924, 4,727,246, 4,733,061 and 4,764,666.

The use of coin actuated gaming and amusement machines is well known. The administrative, labour and logistical problems associated with the management of the very large coin or token holdings in casinos and fun parlours has led to a requirement for gaming machines which are "cashless" in the sense that they are operated by a card or other device whereby the gaming machine is coin-free. Australian patents 511904 and 613484 and Australian patent application 726577/91 illustrate such "cashless" equipment. The latter two disclose the use of smart cards such as those described above.

The management and audit functions in casinos and fun or amusement parlours is complex because of the large turnover, the large number of machines and the vast quantity of statistical information available for analysis. These functions may be performed manually by collating data manually extracted from each individual machine. However it is now not uncommon for this function to be carried out electronically either by a centralised computer facility connected to individual machines by a headline as exemplified in Australian patent 542455 and Australian patent application 726577/91, or by on-site down-loading from individual machines to a transportable data collector as exemplified in Australian patents 553309 and 613484. However failure of the central computer in systems using headlines can render individual machines inoperative. Furthermore in systems using on-site down-loading, security at individual machines can be com-

promised by the lack of a centralised control as this cannot be provided in the absence of on-line real time data.

## SUMMARY OF THE INVENTION

The present invention aims to provide a useful alternative to known secure access control systems which will be reliable and efficient in use.

This invention in one aspect resides broadly in a secure access control system including:

at least one key assembly having a data processing assembly including processor means and data storage means controlled by the processor means to store data relating to the use of a key assembly by a user thereof, the data storage means receiving and storing visual identification image data representative of a visibly identifiable physical feature of a user's body for distinguishing a user authorised to use the key assembly;

at least one access control assembly adapted to receive a key assembly, the access control assembly having a data processing assembly including processor means and data storage means, and visual identity verification means for visual verification of the actual visibly identifiable physical feature of the user of a key assembly by comparison with the image of the visibly identifiable physical feature stored in the key assembly data storage means, and

interface means whereby an access control assembly can communicate with a received key assembly;

whereby use of the key assembly by an unauthorised user is detectable.

As used herein the expression "key assembly" includes devices for permitting access by a user to a secure access system upon correct use of the device by the user. Cards and keys are examples of key assemblies. The secure access control system may include a central computer assembly and communication means for transferring data from the access control assemblies to the central computer assembly.

In one preferred embodiment the visual identity verification means includes optical sensing means for optically sensing the actual visibly identifiable physical feature, and a comparator for comparing the stored visual identification image data with data representative of the image of the actual visibly identifiable physical feature sensed by the optical sensing means.

Alternatively, the visual identity verification means may include image display means for displaying the visibly identifiable physical feature stored as image data in the key assembly data storage means, whereby an operator of the secure access control system can visually compare the displayed image with the actual physical feature of the user of the key assembly.

In a preferred embodiment the visibly identifiable physical feature is the human face.

In a preferred embodiment the access control assemblies include a user interface assembly operable by a user to input data to the access control assembly.

The user interface assembly can include any suitable means whereby the user is able to communicate with the access control assembly and it is preferred that the user interface assembly includes input means and information display means.

The input means could be a joy-stick or a mouse or a screen-based electronic pencil. Alternatively the input means can be a microphone for recording the voice instructions of a user. However it is preferred that the input means includes a keypad.

In a preferred embodiment the access control assembly includes receiving means for closely receiving and releasably retaining a key assembly whereby communication is established between the access control assembly and the key assembly by the interface means.

In a further aspect this invention resides broadly in a method of securing access, the method including:

providing a key assembly having a data processing assembly including data storage means for receiving and storing identification image data representative of an image for distinguishing a user authorised to use the key assembly;

inserting the key assembly in an access control assembly adapted to receive the key assembly and having a data processing assembly including processor means and data storage means whereby communication is established between the access control assembly and the key assembly, and

verifying identification image data stored in the key assembly data storage means whereby use of the key assembly by an unauthorised user is detected.

In another aspect this invention resides broadly in an operating system for a plurality of gaming machines, the operating system including a secure access control system as defined above, wherein each gaming machine includes an access control assembly as described above. It is preferred that the access control assembly includes a user interface assembly as described above.

As used herein the expression "gaming machine" includes any device, assembly or apparatus operable by a user for the purpose of entertainment and gambling. Examples of gaming machines include poker machines, slot machines, pinball machines, roulette tables, blackjack machines, machines for playing bingo, lotto, juggling and other similar lottery-type games, and TV sets and video screens programmed to facilitate gambling and the playing of amusement games.

In a further aspect this invention resides broadly in a gaming machine operating system including:

a plurality of gaming machines;

a central computer assembly;

communication means for transferring data from the gaming machines to the central computer assembly, and

a secure access control system including:

for each user of the gaming machine system, a key assembly having a data processing assembly including processor means and data storage means controlled by the processor means to store data relating to the use of the key assembly by the user, the data storage means receiving and storing identification data representative of the user for distinguishing a user authorised to use the key assembly and/or the gaming machine system, and

for each gaming machine in the gaming machine system, an access control assembly associated with the gaming machine and adapted to receive the key assembly, the access control assembly having user identity verification means for verification of the identity of a user of a key assembly by comparison with the identification data stored in the key assembly data storage means, and a processing assembly including processor means and data storage means controlled by the processor means to store data relating to the use of the gaming machine by the user, the data storage means also receiving and storing data representative of the gaming machine, and

interface means for each gaming machine whereby an access control assembly can communicate with a received key assembly,

whereby in use in circumstances where the gaming machine cannot communicate with the central computer, access by a user not authorised to operate a gaming machine in the gaming machine system can be prevented and access by a user authorised to operate a gaming machine can be allowed, and if a user is allowed access to operate a gaming machine in these circumstances data relating to the use of the key assembly by the user during the circumstances is stored in both the data storage means, data stored in the access control assembly data storage means during the circumstances being transferable to the central computer by the communication means after cessation of the circumstances.

The gaming machines may be operable solely by coins and tokens in known manner, but it is preferred that the key assembly data storage means and the access control assembly data storage means each stores credit data representative of the credit held by a designated user, the credit data stored in the access control assembly data storage means being incremented or decremented when a financial event associated with the key assembly is completed.

As used herein the expression "financial event" means any transaction which increases or decreases the credit held by a designated user of the operating system. Events which increment the credit data storage means include a cash deposit and a gaming machine win by a user, and events which decrement the credit data storage means include operation of a gaming machine by a user and operation of the user interface assembly to access a paging system to provide a chargeable service to the user.

In a preferred embodiment the gaming machine is inoperable when the key assembly is received by the access control assembly. If the key assembly is not received in the access control assembly upon completion of a financial event associated therewith, the credit data stored in key assembly data storage means is incremented or decremented when the key assembly is next received in an access control assembly.

In a preferred embodiment the access control assembly includes a user interface assembly operable by a user to input data to the access control assembly.

The operating system may also include a paging system for transferring messages and paging signals from the gaming machines. In such an arrangement it is preferred that the user interface facility includes paging means whereby a user can access the paging system.

Gaming machines for use in the operating system of this invention may be custom-built for use therewith. However to enable older machines to be used in the operating system the gaming machines may include retrofit interface means for providing data transfer between an existing processor unit in an existing gaming machine and the access control assembly in the gaming machine. In the case of older machines which may not allow access to the processor unit the retrofit interface means may provide data transfer between photo-optic coin sensors, solenoid switches and motors in an existing machine and the access control assembly.

In another aspect this invention resides broadly in a method of controlling the operation of a plurality of gaming machines, the method including:

providing a key assembly to each user authorised to use a gaming machine, the key assembly having a data

processing assembly including processor means and data storage means controlled by the processor means to store data relating to the use of the key assembly by the user, the data storage means receiving and storing credit data representative of the credit held by the user and identification data representative of the user for distinguishing a user authorised to use the key assembly and/or the gaming machine system;

inserting the key assembly in an access control assembly associated with each gaming machine in the gaming machine system, the access control assembly being adapted to receive the key assembly and having user identity verification means for verification of the identity of a user of a key assembly and a processing assembly including processor means and data storage means controlled by the processor means to store data relating to the use of the gaming machine by the user, the data storage means also receiving and storing data representative of the gaming machine and credit data representative of the credit held by the user;

verifying the identity of a user of a key assembly by comparison in the user identity verification means with identification data stored in the key assembly data storage means, whereby access by a user not authorised to operate a gaming machine in the gaming machine system is prevented and access by a user authorised to operate a gaming machine is allowed, and

incrementing or decrementing the credit data stored in the access control assembly data storage means when a financial event associated with the key assembly is completed;

whereby,

if the key assembly is not received in the access control assembly upon completion of a financial event associated therewith, the credit data stored in the key assembly data storage means can be incremented or decremented when the key assembly is next received in an access control assembly, and

if the gaming machine is linked to a central computer, in circumstances where the gaming machine cannot communicate with the central computer, data stored in the access control assembly data storage means during the circumstances can be transferred to the central computer after cessation of the circumstances.

In a further aspect this invention resides broadly in a secure access control system including:

at least one key assembly having a data processing assembly including data storage means, the data storage means receiving and storing visual identification image data representative of a visibly identifiable physical feature of a user's body for distinguishing a user authorised to use the key assembly;

at least one access control assembly adapted to receive a key assembly, the access control assembly having a data processing assembly including processor means and data storage means, and visual identity verification means for visual verification of the actual visibly identifiable physical feature of the user of a key assembly by comparison with the image of the visibly identifiable physical feature stored in the key assembly data storage means, and

interface means whereby an access control assembly can communicate with a received key assembly; whereby use of the key assembly by an unauthorised user is detectable.

## BRIEF DESCRIPTION OF THE DRAWINGS

In order that this invention may be more easily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention, wherein:

FIG. 1 is a simplified schematic block diagram of a secure access control system including visual identification means;

FIG. 2 is an illustration of a user interface assembly for use in the system of FIG. 1;

FIG. 3 is a flow diagram illustrating a photo identification process in the control system of FIGS. 1 and 2;

FIG. 4 is a detailed schematic block diagram of a secure access control system in accordance with the invention; FIGS. 5, 6 and 7 are schematic block diagrams of a secure access control system for a gaming establishment;

FIG. 8 illustrates a player interface assembly for association with a gaming machine;

FIG. 9 is a perspective view of a key assembly and housing therefor;

FIG. 10 illustrates a player interface assembly attached to a poker machine;

FIG. 11 is a flow diagram illustrating a machine playing sequence for a gaming machine connected in the control systems of FIGS. 5, 6 and 7;

FIG. 12 is a flow diagram illustrating a machine pay out sequence for a gaming machine connected in the control systems of FIGS. 5, 6 and 7;

FIG. 13 is a flow diagram illustrating entry of machine credit to a gaming machine connected in the control systems of FIGS. 5, 6 and 7; and

FIG. 14 is a flow diagram illustrating operation of a central crediting system connected in the control systems of FIGS. 5, 6 and 7.

## DETAILED DESCRIPTION OF THE INVENTION

A visual identification access control system in accordance with one embodiment of the present invention will now be described with reference to FIGS. 1 to 3.

Visual identification access control system 11 comprises a visual sensor unit 12, an interface unit 13 arranged to interface with a key assembly memory storage device 14 and a processing means 15.

Control system 11 is connected to a secure system 16. The secure system is one which requires identification of a user before the user is allowed access to the system. Examples include automatic teller machines connected to central data base storing bank account information, and a control system where gaming devices are connected to a central controller storing account information. The visual identification system of the present invention is not limited to use with these examples.

Each user of secure system 16 is provided with a key assembly memory storage device 14 which contains image information relating to the visual facial appearance of the user. The memory storage device 14 may be an "intelligent key" containing a digital processing device and memory. The memory stores the image data in digital form. The interface unit 13 includes an intelligent key reader which interfaces with memory storage device 14 to obtain the digital image data from the memory. The interface unit 13 provides the processor means 15 with the digital image information obtained from the memory device 14.

The visual sensor unit 12 includes a camera 17 containing a charge coupled device (CCD) sensor and a lens positioned to view the face of a user standing by the apparatus. The CCD obtains a visual readout of the facial appearance of the user and the sensor unit 12 converts this visual readout into digital form which is transmitted to the processor unit 15.

The processor unit 15 compares the digital image information obtained from the visual sensor unit 12 with the digital information obtained from the interface unit 13. If the data from units 12 and 13 corresponds, processing means 15 determines that a positive identification has been made. That is, the person with the key assembly memory device 14 is the same person being viewed through the lens. The processor 15 may then indicate to the secure system 16 that a positive identification has been made and the user will then be allowed access to the secure system, eg to withdraw cash from a bank account.

Receiving means in the form of slot 18 is provided in unit 13 for insertion of intelligent key 14.

A keyboard 19 is also coconnected to the secure system 16. The keyboard may also be connected to the processor 15. The keyboard 19 allows a user to conduct transactions with the secure system 16. The number and type of keys provided on the keyboard 19 will depend on the functional requirements of the secure system 16.

FIG. 2 shows a front view of the face 21 of user interface 13. (In this embodiment the keyboard 19 forms part of the interface unit 13.) A liquid crystal display 20 is provided for conveying information to the user. For example, the display may prompt the user to take necessary action to progress the identification process.

In this embodiment the user is also provided with a PIN number which is entered by keyboard 22 before access to the secure system 16 is enabled. The use of both a PIN number and the visual identification technique increases the security of the system.

In use, the display 20 can prompt the user to insert the key 14 into the slot 18. The user will then be asked to input the PIN number on the keyboard 22. If the PIN number is correct, the apparatus will proceed to the visual identification stage. A switch 23 is provided to cause the camera 17 to be activated to take a frame. The switch 23 may be activated by the user. A frame is taken by the CCD unit, converted to digital and transferred to the processor unit 15. The lighting conditions at the site are then altered (darker or lighter) and a second frame is taken by the CCD unit. A light sensor 24 is provided to detect lighting conditions. This frame is also converted to digital and transferred to the processor unit 15. The change of light conditions ensures that the diameter of the pupil of the eye of the user will change. This is a test to ensure that the face is that of a real person and not a photograph. The processor will determine whether the pupil diameter has changed and if there has been no change, access to the secure system 16 will be denied. If pupil identification has changed the visual identification process will proceed.

The image stored in the key and obtained by interface unit 13 is transferred to the processor means 15. A comparison is then carried out between the image from the unit 12 and the image from the interface unit 13.

The flow chart of FIG. 3 is illustrative of the above process.

FIG. 4 is a detailed schematic block diagram of a secure access control system in accordance with the invention. A key assembly, user variable device or memory storage device 25 includes data processing assembly 26 having a

central processor or digital processing device 27 and data storage means 28 for storing identification data 29 and image data 30. Interface 31 provides communication between key assembly 25 and an access control assembly 33.

Access control assembly 33 includes a data processing assembly 44, user interface assembly or interface unit 45, receiving means 38 for receiving key assembly 25, and identity verification means 39.

Data processing assembly 44 is controlled by a central processor 34 and includes data storage means 35. User interface assembly 45 includes input means in the form of keypad 36 and information display means 37 in the form of a liquid crystal display as previously described. Receiving means or keyslot 38 includes an interface 32 for providing communication with key assembly 25. Identity verification means 39 in the form of processor means adapted to compare information is associated with a sensing means, sensor or visual sensing unit in the form of a camera 40 as previously described. Image display means 46 in the form of a video screen is provided at the access control assembly 33 to display a screen picture of the face of the legitimate holder of the key assembly 25. Interface means 41 is adapted to provide communication between access control assembly 33 and other access control assemblies and a central computer assembly or control unit 42 via communication bus 43.

A gaming establishment control system which incorporates an operating system in accordance with an embodiment of the present invention will now be described with reference to FIGS. 5 to 14.

With reference to FIGS. 5 and 6, the control system comprises a central computer 42 for controlling operations of the system. A communication system generally designated by reference numeral 43 connects the central computer 42 to peripheral units. A plurality of gaming machines 49 are connected to the control system. Poker machines incorporate counters 34 for counting the number of credits input to a machine and taken out of the machine during a predetermined playing period and for monitoring, exactly other machine operations, switches 55 controlled by a keyboard for operation of the machine and coin input meters 56 which provide a number of pulses when coins are input or taken out of the machine. Conventional poker machines are coin operated and prizes may be paid out in coins at the machine. This embodiment of the present invention enables operation of poker machines without the need to insert coins. Further, no coin pay out is necessary when a prize is won.

A large gaming establishment may have many hundreds of poker machines. All these poker machines may be connected in the control system of the present embodiment of the invention. The control system includes an access control assembly 57 associated with each poker machine 49. Each access control assembly 57 is connected in a loop format in which each assembly for each poker machine is coconnected. The loop is connected to the central computer system. Two serial data communication lines are employed, one for carrying data and the other being supervisory. Depending on how many machines 49 are to be connected in the control system, a plurality of loops may be employed.

The control system also incorporates a number of other types of terminals, apart from the gaming device access control assemblies 57, which are also connected to the central computer by the communication system 43. These include remote cash register units 58, remote auto-teller units 59, and credit/debit terminals 60.

The central computer 42 is also connected to a paging system 52 having CPU control unit 61 and paging transmitter 62. These provide a paging service. The computer is also connected to computer controlled signs 63, which may be for the purpose of advertising, providing linked jackpot information etc.

The system constitutes a complete control system for monitoring operation of the gaming establishment. Transactions with each machine 49 can be monitored by the central computer 42. In addition, financial transactions at other points in the establishment, such as at the bar or restaurant, can also be monitored by the central computer. The paging function enables services to be provided to users of the machine 49 without the users needing to leave their seat by the machine. Keyboard means such as keys 53 as described with reference to FIGS. 7 and 8 and associated with the access control assembly 57 are actuable to instigate a paging function to call a service operator to attend to the needs of the user, depending upon the key actuated on the user assembly 45.

Gaming machines for use in the operating system of this invention may be custom-built for use therewith. As seen in FIGS. 6 and 7, to enable older machines to be used in the operating system the gaming machines 49 have a retrofit interface board 50 which includes adaptor circuits specific to a given machine for providing data transfer between an existing processor unit and access control assembly 57. Some older machines do not allow access to the processor unit and interface board 50 provides data transfer between photo-optic coin sensors, solenoid switches and motors and access control assembly 57.

FIG. 8 illustrates a user interface unit 64 to be mounted on each machine 49 as shown in FIG. 10. The unit 64 is operable by the user on insertion into the key slot 65 of an intelligent key 25 containing a micro processor and memory store. Key slot 65, which with key 25 is illustrated in perspective view in FIG. 9, is installed in user interface unit 64 with an upwards inclination so that the drinks of users if accidentally spilled, will not collect in the slot. It will of course be realised that the interface unit may be built into the gaming machine and that in the case of video machines, the display means can be the video screen.

To obtain access to the machine 49, the user inserts intelligent key 25 into the key slot 65 and enters the PIN number by actuation of the appropriate keys on the keyboard 66. The intelligent key 25 contains in its memory credit information indicating the amount of credit available to the owner of the key for playing the machines 49. Whether the player has enough credit on the key will be checked by the unit 64 and if approved the player will be allowed to play machine 49. The player may play the machine with any amount of credit available on the key 25. As credit is entered to play the machine it is debited from the key 25. As described subsequently with reference to the "machine player system" and FIGS. 11 and 13, key 25 must be removed from keyslot 65 before play can be commenced. Winnings are credited to the memory store on the key when the key is reinserted in keyslot 65.

The control system will also "double check" the credit on the key with account information for the user held on data base by the central computer 42. This check is preferably carried out before play commences. If there is an inconsistency between the account on central data base and the credit shown on the key, the user will be asked to report to an office of the gaming establishment and will not be allowed to play the machine.

The user's account on the central computer 42 may also be updated in response to playing the gaming machine 49. If a user's account or key has no credit, credit may be obtained at a change box having debit/credit unit 60. If the user deposits money at the change box it will be credited to both key and account by the debit/credit unit 60. The player can then proceed to play a machine.

The central computer 42 may also obtain other transaction information from the machines 49. Any information required for audit purposes may be obtained by the central computer 42 in this manner. There is no need for an operator to physically attend a machine except in cases of malfunction. The central computer 42 continually polls the machines for data.

If a user requires a service function or a drink at the machine, the appropriate button 53 on the keyboard is pressed and a service operator will be paged by the paging system. The central computer 42 detects that a paging operation is required and causes the paging CPU 61 to cause a paging transmission via paging transmitter 62 to page a designated operator by a remote paging unit. The designated operator can then approach the user to carry out the required service. If a drink or other service is to be provided which will cost the user money, the user may pay for it by debiting credits from his key. This can be done at the user interface unit 64.

Any number of desired paging functions can be carried out by the paging CPU 61. The paging system is responsive not only to users, and a facility is provided for automatically paging service operators in some circumstances.

For example, if a key is accidentally left in machine 49 after a predetermined time the service operators are paged with an appropriate message. If credits are accidentally left on a machine the attendant will again be paged with an appropriate message after the elapse of a given time without machine activity. The attendant can then clear the machine by inserting an operator key and entering a code. The computer 42 will be updated with the member's new credit. This will cause a discrepancy between the member's key and the credit in the central computer, and the next time the member plays a machine the display 37 will signal to the member to check at the change box. The key credit can then be updated by the cashier.

In order to obtain cash the user utilises a change box or reception 60. Money can be collected from the change box and the key credit will be debited.

Key reader units 58 are provided at the bar, restaurant and at other locations to enable a user to use a key to obtain other services. These units are also connected to the central computer 42 to update account information.

Auto-teller units 59 are also provided and may have a facility for visual identification in accordance with the first aspect of the present invention.

FIG. 7 is a detailed schematic block diagram of an operating system for a number of gaming machines 49 utilising a secure access control system 57 in accordance with the invention. A key assembly, user carryable device or memory storage device 25 includes data processing assembly 26 having a central processor or digital processing device 27 and data storage means 28 for storing identification data 29, image data 30 and credit data 47. Interface 31 provides communication between key assembly 25 and access control assembly 57.

Access control assembly 57 includes a data processing assembly 44, user interface assembly or interface unit 45, receiving means 38 for receiving key assembly 25, and



identity verification means 39. Access control assembly 57 can be connected to a gaming function 51 by a retrofit interface unit 50 as previously described.

Data processing assembly 44 is controlled by a central processor 34 and includes data storage means 35 for storing credit data 47 and gaming machine data 48. A user interface assembly 45 includes input means in the form of keypad 36, information display means 37 in the form of a liquid crystal display and paging means or buttons 53 as previously described. Receiving means or keyslot 38 includes an interface 32 for providing communication with key assembly 25. Identity verification means 39 in the form of processor means is adapted to compare information. Interface means 41 is adapted to provide communication between access control assembly 33 and communication bus 43 for communication with other access control assemblies and a central computer assembly or control unit 42 and to a paging system 52.

It will be realized that a cashless system can be provided in accordance with the invention in which the intelligent key contains an electronic photo ID facility, key number, user function (member, attendant, operator), user details (name, address) and transaction details.

The key holder has a PIN code which is not accessible to operators. Transactions are stored and reported by key number and not by member name. The key can be used for different clubs with the data of one club not being accessible by other clubs. The key is thus extremely secure and cannot be copied.

Key readers are provided on each machine, at each entrance with monitors for photo ID check, at each payout area optionally with an ID monitor, at each bar service area, at reception area with camera for new membership, and at automatic tellers with reader/writer/camera.

FIGS. 11 to 14 are self-explanatory flow charts showing machine playing sequence, machine pay out sequence, entry of credit into the machine and operation of the central crediting system. The following brief summaries outline operation of the system in a club or casino and should be read in conjunction with FIGS. 11 to 14.

#### Credit System

Member pays for credits at change box.  
Member key inserted in reader, enters PIN number.  
Operator checks details and enters credit amount.  
Credit placed on key and key ejected.  
Transaction with member, operator, amount, date logged on CPU.

#### Machine Player System

Insert key in machine.  
Display asks for PIN number.  
Enter PIN number.  
Main CPU checks details and credit.  
Display asks for amount required to be entered in machine.  
Enter amount.  
Credit on key and CPU are updated.  
Key removed.  
Coin credit meter on machine incremented.  
When play finished insert key in reader and press "collect" on poker machine.  
Key and CPU updated with credits and machine coin credits cancelled.

#### Remove key.

If a key is accidentally left in a machine after a predetermined time the attendants are paged with a message indicating a key may be left in the machine.

If there are no credits left on the machine at the end of play there is no need to insert the key—the machine will automatically be released after predetermined time.

A member may reserve a machine, with credits on it, and without having his key actually in the machine, and get a drink etc.—the machine will not accept any other key (except an attendant's) when in this mode.

If credits are accidentally left on a machine (i.e. attendant will again be paged with an appropriate message after a time without machine activity. The attendant can then clear the machine by inserting his key and entering a code. The CPU will be updated with the members new credit. This will give a discrepancy between the member's key credit and the credit in the CPU. The next time the member plays a machine he will be asked by the display to check his credits at the change box. The key credit will then be updated by the cashier (a message with the reason for the update will be given at their terminal).

#### Payment

Money collected from key credit at change box, automatic teller.

Key inserted in reader.

PIN number entered.

Credit amount checked by CPU

Photo ID if required.

OK given to operator.

Record again kept of transaction

#### Machine Attendants

Attendants have their own keys.

Log on/off duty can be performed.

Key inserted in machine before any service.

#### Reports

Reports can be generated by management by selecting their own set of specifications from the database.  
Examples include:

Cash in	from credits entered to keys
Cash out	from key credits cashed in
Key Credits	credit on keys not claimed
Bar Cash	key credits used at bar
	cash taken at bar
	all functions
Meter Readings	types of players, machines,
Player Activity	cash credits used
Restaurant Cash	cash taken
	key credits used
Entertainment	cash taken

It will be appreciated that a secure access control system in accordance with the present invention has many advantages.

The provision of a secure intelligent user key, on-site processor storage capacity and the ability to check identity on site without the necessity to revert to a central computer, enables stand-alone operation and means there is little

restriction on the number of sites which can be run on a single extended network. Integration of an internal paging system enables automatic reporting on all important events within the system to users who are potentially concerned with an event, and provides extremely efficient utilisation of human resources. Furthermore, it offers immediate service to customers and users in casino-type installations.

The system allows for both supervisory control and data transfer whereby multiple facilities can be provided with minimum congestion. Electronic signs such as general information, jackpot information and advertising can be easily controlled and it is possible with the system to provide inter-establishment jackpots as well as internal jackpots.

The secured access control system in accordance with this invention also provides a facility for central updating whilst monitoring all sites, and generates virtually real time information from all sites.

The paging facilities provide automatic ordering of goods on site, jackpot information for management, machine reserve reporting and indicates to staff the need to service machines. These capabilities provide significant advantages in clubs, casinos and the like.

It will be realised that a central computer failure does not cause the system to fail and that individual operations can continue on-site because of the provision of on-site processor facilities and the high level security provided by the intelligent card. The central computer is updated when it comes back on-line.

Linked jackpot facilities can only be provided satisfactorily with on-line systems and the utilisation of linked jackpots is facilitated by the present invention because of the instant automatic paging facilities which are available if problems occur. Provision of such a system is desirable for the smooth operation of linked jackpots.

It will also be realised that the system according to the present invention overcomes certain problems of the prior art and in particular provides for the automatic update of player records and so does not rely on a player having to hand in a key in order for the centralised computer to access information for collation and analysis. This is one disadvantage with the system outlined in Australian patent application 72657/91 because of the fact that it is usual for players at casinos to lose their credit and there is thus often little incentive for a player to return a key to a central location.

Moreover as has been described above in the outline of the "machine player system", the gaming system in accordance with the present invention ensures that cards are not inadvertently left in machines when credit has expired and the cards are spent. This results from the system not allowing a game to be played or gambling to commence before the key assembly is removed from the keyslot. This overcomes disadvantages of prior art arrangements in which keycards are commonly left in the machines. In these systems, although a discrete amount of credit may be downloaded prior to a period of play commencing, the card remains in the keyslot for updating either with each event or at the conclusion of a period of play. On the other hand the key assembly of the present invention is most usually in the players hand or pocket and will be in this location, rather than in the machine slot, when credit on the card is exhausted.

Furthermore, by providing a system in which individual debits are incremented each time a machine is played, the system of this invention overcomes disadvantages of earlier "cashless" systems in which the total amount of credit is downloaded into the machine when the player's card is

inserted in the machine and read by the card reader. This is of particular significance if, as is usual, regulatory authorities require an electro-mechanical counter to be maintained in machines even if operation is controlled by a CPU. The downloading of a large number of credits, for example when a relatively large cash deposit is made when a card is inserted into a small value machine, means that such a counter can fail due to excessive mechanical wear or the machine is either ineffective or substantially inoperable for the time taken for the machine to increment the total number of credits.

Furthermore, intelligent processors in known systems do not contain player credit information and it is necessary that the player's card be accessed in order to obtain such information. Security is thereby compromised because the card and the machine do not both contain updated credit records and the card itself can be subjected to electronic tampering.

The invention thus provides a practical "cashless" casino operating system which is able to support a very large number of gaming machines without the need to provide a high powered and expensive central computer system.

It will of course be realised that whilst the above has been given by way of an illustrative example of this invention, all such and other modifications and variations hereto, as would be apparent to persons skilled in the art, are deemed to fall within the broad scope and ambit of this invention as is hereinafter claimed.

I claim:

1. A gaming machine operating system including:

- a plurality of gaming machines;
- a central computer assembly;
- communication means for transferring data from said gaming machines to said central computer assembly, and

a secure access control system including:

- for each user of the gaming machine system, a key assembly having a data processing assembly including key assembly processor means and key assembly data storage means controlled by said key assembly processor means to store data relating to the use of said key assembly by said user, said key assembly data storage means receiving and storing identification data representative of said user for distinguishing a user authorized to use at least one of said key assembly and the gaming machine system, and
- for each gaming machine in the gaming machine system, an access control assembly associated with said gaming machine and adapted to receive said key assembly, said access control assembly having user identification verification means for verification of the identity of a user of a key assembly by comparison with said identification data stored in said key assembly data storage means, and a processing assembly including access control assembly processor means and access control assembly data storage means controlled by said access control assembly processor means to store data relating to the use of said gaming machine by said user, said access control assembly data storage means also receiving and storing data representative of said gaming machine, and
- interface means for each gaming machine whereby an access control assembly can communicate with a received key assembly;

whereby, in use in circumstances where the gaming machine cannot communicate with said central computer, access by a user not authorized to operate a gaming machine in said gaming machine system

can be prevented, and access by a user authorized to operate a gaming machine can be allowed, and, if a user is allowed access to operate a gaming machine in said circumstances, data relating to the use of the key assembly by said user during said circumstances is stored in said key assembly storage means and said access control assembly data storage means, data stored in the access control assembly data storage means during said circumstances being transferable to said central computer by said communication means after cessation of said circumstances wherein said interface means for each gaming machine is included in a respective access control assembly and wherein a respective gaming machine is inoperable when a key assembly is received within a respective interface means.

2. A gaming machine operating system as claimed in claim 1, wherein said key assembly data storage means and the access control assembly data storage means each stores credit data representative of the credit held by a designated user, the credit data stored in said access control assembly data storage means being incremented or decremented when a financial event associated with the key assembly is completed.

3. A gaming machine operating system as claimed in claim 1, wherein if said key assembly is not received in said access control assembly upon completion of a financial event associated therewith, the credit data stored in said key assembly data storage means is incremented or decremented when said key assembly is next received in an access control assembly.

4. A gaming machine operating system as claimed in claim 1, and including a paging system for transferring messages and paging signals from said gaming machines.

5. A gaming machine operating system as claimed in claim 4, wherein said user interface facility includes paging means whereby a user can access said paging system.

6. A gaming machine operating system as claimed in claim 1, wherein said gaming machines include retrofit interface means for providing data transfer between a processor unit in an existing gaming machine, or between photo-optic coin sensors, solenoid switches and motors in an existing machine, and the access control assembly in said gaming machine.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT C**



US 20030220138A1

(19) **United States**(12) **Patent Application Publication** (10) Pub. No.: US 2003/0220138 A1  
Walker et al. (43) Pub. Date: Nov. 27, 2003(54) **METHOD AND APPARATUS FOR EMPLOYING FLAT RATE PLAY**

Related U.S. Application Data

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James A. Jorasch, Stamford, CT (US);  
Geoffrey M. Gelman, Stamford, CT  
(US); Stephen C. Tulley, Fairfield, CT  
(US); Steven M. Santisi, Ridgefield,  
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Stamford, CT (US)

(60) Provisional application No. 60/374,385, filed on Apr. 19, 2002.

## Publication Classification

(51) Int. Cl.<sup>7</sup> ..... A63F 13/00  
(52) U.S. Cl. .... 463/25; 463/20

(57)

## ABSTRACT

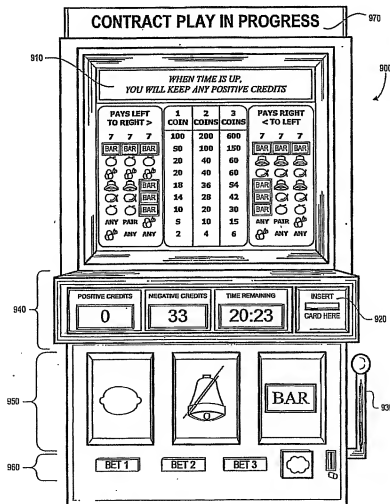
Systems and methods are provided allowing a player to play a gaming device and receive a predetermined number of outcomes in exchange for a payment. The gaming device generates at least the predetermined number of outcomes, and adjusts a balance of the player device based on the outcomes. The player can continue playing regardless of whether the balance is less than zero.

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(21) Appl. No.: 10/420,066

(22) Filed: Apr. 21, 2003



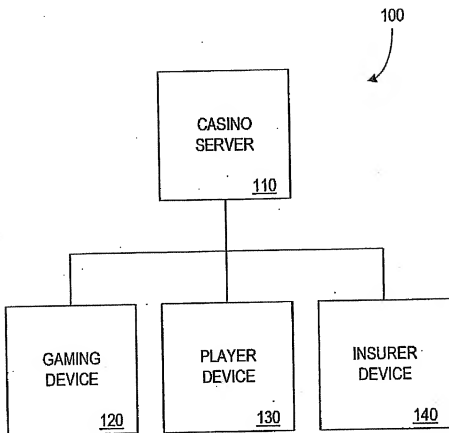


FIG. 1

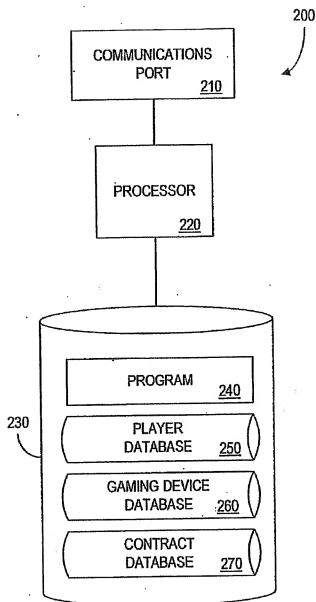


FIG. 2

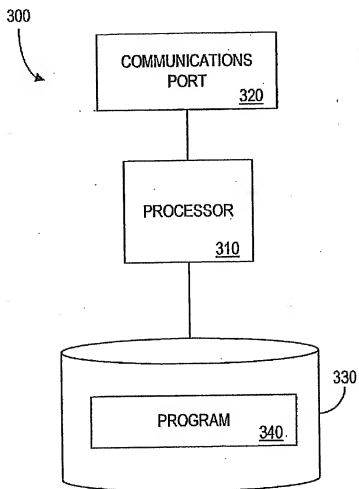


FIG. 3



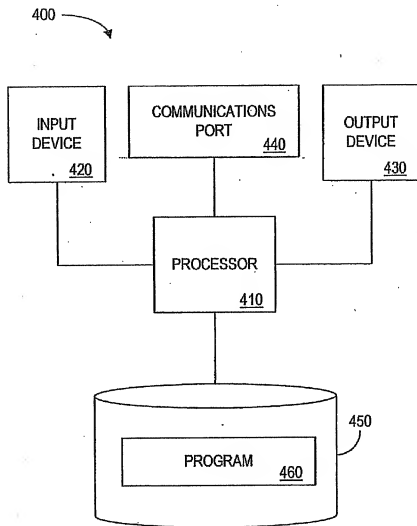


FIG. 4

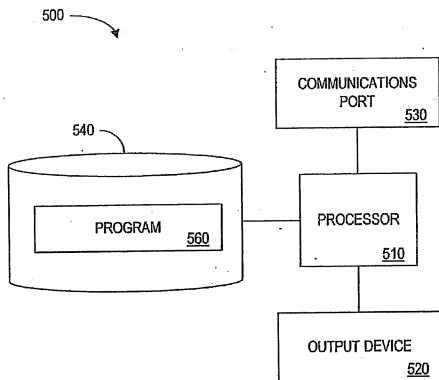


FIG. 5

600

PLAYER IDENTIFIER 610	NAME 520	ADDRESS 530	FINANCIAL ACCOUNT IDENTIFIER 540	DEMOGRAPHIC 550	CREDITS 560	LIFETIME COIN IN 570
P11123	SAM BROWN	ANYPLACE, USA	1111-1111- 1111-1111	MALE, AGE 23	68 AT \$0.25 EACH	\$600
P222234	LINDA JONES	SOMEPLACE, USA	2222-2222- 2222-2222	FEMALE, AGE 47	0	\$14400

680

685

FIG. 6

700

GEMING DEVICE IDENTIFIER 710	NAME 720	MANUFACTURER 730
G333333	DIAMOND MINE	ABC CORP.
G444444	CRAZY DEUCES	XYZ CORP.

740

745

FIG. 7

CONTRACT IDENTIFIER	PLAYER IDENTIFIER	INITIAL PLAYER BANKROLL	DESCRIPTION	COST	RESULT	AMOUNT OWED THE PLAYER	AMOUNT OWED THE INSURER
810	820	830	840	850	860	870	880
C111	P222333	N/A	2000 PULLS, \$0.25 PER PULL, PLAYER KEEPS NET WINNINGS	\$20.00	CONTRACT ENDS WITH PLAYER AT -\$45	0	\$20.00 -\$45.00 = -\$25.00
C222	P444555	N/A	1 HOUR OF PLAY, \$1.00 PER PULL, PLAYER KEEPS GROSS WINNINGS	\$100.00	CONTRACT ENDS WITH PLAYER AT + \$97	\$97	\$100.00
C333	P666777	\$2,000	1,000 PULLS PER WEEK, \$2.00 PER PULL, OCCURRING BETWEEN 8-9PM TUESDAYS FOR 12 WEEKS OR UNTIL PLAYER LOSES BANKROLL	N/A	PLAYER LOST BANKROLL	0	N/A
C444	P888999	\$100	90 MINUTES OF PLAY, \$0.50 PER PULL	N/A	PLAYER ENDS UP WITH \$120	\$120	N/A
C555	P111000	\$200	\$0.63 PER PULL, DOUBLE BETS FOR TWO PULLS AFTER ANY WIN, STOP AFTER JACKPOT, LOSS INSURED BEYOND \$200	\$20.00	2 MINS. REMAINING, PLAYER AT + \$213	TBD	TBD
TOTAL OWED THE INSURER \$76.00							890

FIG. 8

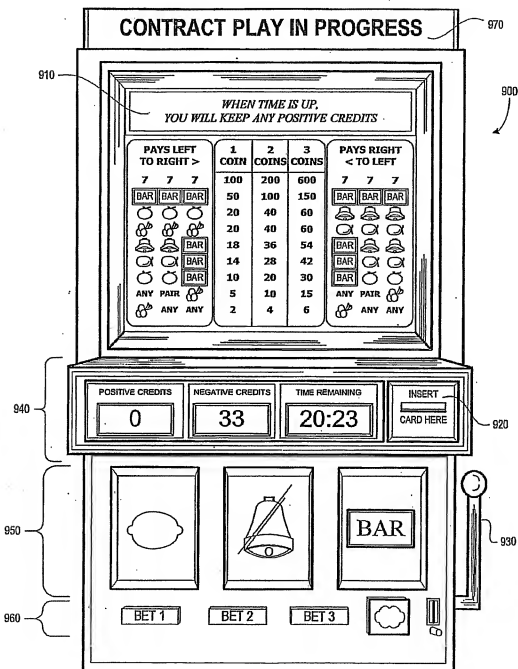


FIG. 9

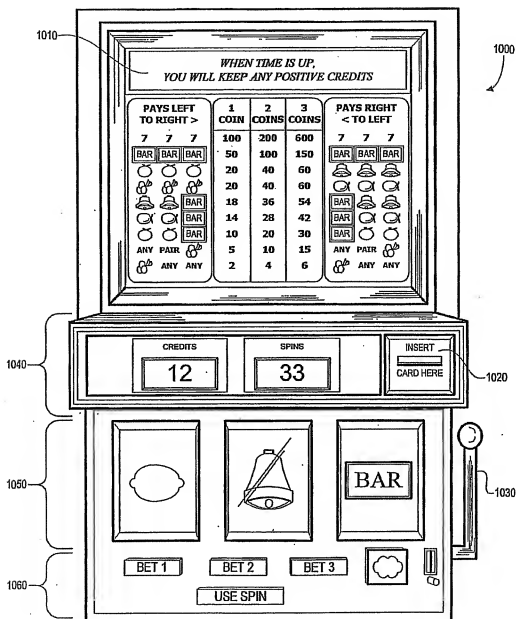


FIG. 10

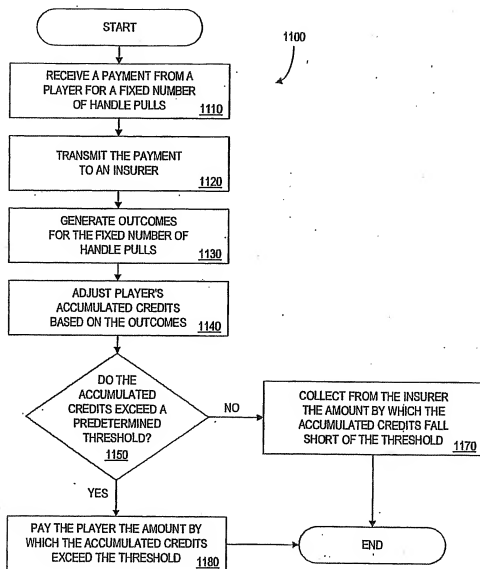


FIG. 11



## METHOD AND APPARATUS FOR EMPLOYING FLAT RATE PLAY

[0001] This application claims the benefit of priority of U.S. Provisional Patent Application Serial No. 60/374,385, filed Apr. 19, 2002, entitled "GAMING DEVICE METHODS AND APPARATUS EMPLOYING FLAT RATE PLAY", the entirety of which is incorporated by reference herein for all purposes.

### BACKGROUND

[0002] Gaming devices are very popular in the U.S. and abroad. Gaming devices, such as slot machines, video poker machines, video blackjack machines, video roulette machines, video keno, and video bingo machines, provide casinos with the majority of their profits.

[0003] Consequently, it would be advantageous to improve the appeal of gaming devices and increase their usage by players.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1 is a block diagram of a system consistent with the present invention.

[0005] FIG. 2 is a block diagram of one embodiment of a casino server.

[0006] FIG. 3 is a block diagram of one embodiment of an insurer device.

[0007] FIG. 4 is a block diagram of one embodiment of a gaming device.

[0008] FIG. 5 is a block diagram of one embodiment of a player device.

[0009] FIG. 6 is a table illustrating an exemplary data structure of a player database for use in the present invention.

[0010] FIG. 7 is a table illustrating an exemplary data structure of a gaming device database for use in the present invention.

[0011] FIG. 8 is a table illustrating an exemplary data structure of a contract database for use in the present invention.

[0012] FIG. 9 is a front planar view of an illustrative gaming device, according to one embodiment.

[0013] FIG. 10 is a front planar view of another illustrative gaming device, according to one embodiment.

[0014] FIG. 11 is a flow chart illustrating an exemplary process according to an embodiment of the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

[0015] Applicants have recognized that it would be advantageous to keep players playing an appealing gaming device, rather than risk having such players stop playing and, e.g., play other gaming devices at competing locations.

[0016] Applicants have also recognized that players would find game play with a known up-front cost to be appealing, and such up-front costs and corresponding opportunity costs can be managed.

[0017] Applicants have also recognized that players would find longer play with generally lower up-front costs to be appealing.

[0018] In various embodiments of the present invention, a casino can significantly increase the usage of its gaming devices by retaining players and increasing average utilization of gaming devices. Moreover, a casino need not significantly alter its operations to do so.

[0019] In various embodiments of the present invention, a player may experience the excitement of a relatively large number of plays (outcomes) for a relatively low cost, and/or limit or eliminate his risk of losses.

[0020] In various embodiments of the present invention, a player need no longer be present at a gaming device to enjoy the gaming experience.

[0021] Several embodiments of the invention disclosed herein allow a player to make a relatively large number of plays at a gaming device for a relatively low price. For example, a player may pay in advance for a set of outcomes of the gaming device. The player would then receive a balance at the gaming device which could be used for outcomes, or plays. Such a balance might not be withdrawn as funds until, e.g., after at least a predetermined number of outcomes are generated by the gaming device.

[0022] In such an embodiment, amounts of wagers the player makes could be deducted from the balance, and amounts of winnings could be added to the balance. Once the player has finished the predetermined number of outcomes, the player could withdraw as funds ("cash out") the remaining balance. Alternatively, the player may receive some payment that is based on the remaining balance.

[0023] According to an embodiment, the player may continue to play even when the balance of the gaming device is zero or negative. If so, even if the balance is negative after the predetermined number of outcomes is generated, the player need not reimburse the gaming device for the "negative amount". Thus according to that embodiment, by purchasing the predetermined number of outcomes, the player enjoys the number of outcomes without the risk of any loss. The player need pay for only the cost of the predetermined number of outcomes.

[0024] Various other embodiments are described in detail herein, and still other embodiments will be apparent to those of skill in the art upon a review of the present disclosure.

[0025] Referring now to FIG. 1, an apparatus 100 according to embodiments of the present invention includes a casino server 110 that is in communication with one or more gaming devices 120, one or more player devices 130, and one or more insurer devices 140. Each of the gaming devices, player devices and insurer devices may comprise computers, such as those based on the Intel® Pentium® processor, that are adapted to communicate with the casino server 110; portable types of computers, such as a laptop computer; a palm-top computer; a hand-held computer; or a Personal Digital Assistant (PDA). Other equivalent devices capable of performing the methods specified herein would be apparent to one of skill in the art.

[0026] Any number of gaming devices, player devices and insurer devices may be in communication with the casino server 110. The number of each depicted in FIG. 1 is solely for purposes of illustration.

[0027] The casino server 110 may communicate with the gaming devices, the player devices and the insurer devices directly or via a network, including without limitation the Internet, a wireless network protocol, a local area network (or any combination thereof), through a Web site maintained by casino server 110 on a remote server or over an on-line data network including commercial on-line service providers, and bulletin board systems. The casino server may communicate with the gaming devices, the player devices and the insurer devices directly or indirectly. In yet other embodiments, the devices may communicate with casino server 110 over radio frequency (RF), cable TV, satellite links and the like.

[0028] Those skilled in the art will readily understand that devices in communication with each other need not be continually transmitting to each other. On the contrary, such devices need only transmit to each other as necessary, and may actually refrain from exchanging data most of the time. For example, a device in communication with another device via the Internet may not transmit data to the other device for weeks at a time.

[0029] The casino server 110 may function as a "Web server" that generates Web pages (documents on the Web that typically include an HTML file and associated graphics and script files) that may be accessed via the Web and allows communication with the casino server 110 in a manner known in the art.

[0030] FIG. 1 depicts only an embodiment of the invention. Other arrangements of devices to perform various methods specified herein will be readily appreciated by those of skill in the art.

[0031] FIG. 2 illustrates an embodiment 200 of the casino server 110 (FIG. 1). The casino server 110 may be implemented as a system controller, a dedicated hardware circuit, an appropriately programmed general-purpose computer, or any other appropriate device including without limitation electronic, mechanical or electromechanical devices.

[0032] The server of the illustrated embodiment comprises a processor 210, such as one or more Intel® Pentium® microprocessors. The processor 210 is in communication with a communication port 220 and a data storage device 230. The communications port 220 allows the processor 210 to communicate with other devices, such as the insurer device 140. The data storage device 230 comprises magnetic memory, optical memory, semiconductor memory or any combination thereof. The data storage device 230 may include, for example, Random Access Memory (RAM), Read-Only Memory (ROM), a compact disc, digital video disc and/or a hard disk. The processor 210 and the storage device 230 may each be, for example: (i) located entirely within a single computer or computing device; or (ii) connected to each other by a remote communication medium, including without limitation a serial port cable, a telephone line, a network connection or a radio frequency transceiver. In some embodiments, the casino server 110 may comprise one or more computers that are connected to a remote server computer for maintaining databases.

[0033] The data storage device 230 stores a program 240 for controlling the processor 210. The processor 210 performs instructions of the program 240, and thereby operates in accordance with the present invention, and particularly in

accordance with the methods described in detail herein. The program 240 may be stored in a compressed, uncompiled and/or encrypted format, as well as in a variety of other forms known in the art. The program 240 furthermore includes program elements that may be necessary, including without limitation an operating system, a database management system and "device drivers" for allowing the processor 210 to interface with peripheral devices. Appropriate program elements are well known to those skilled in the art, and need not be described in detail herein.

[0034] According to an embodiment of the present invention, the instructions of the program 240 may be read into a main memory from another computer-readable medium, such as into RAM from hard drive or ROM. Execution of sequences of the instructions in program 240 causes processor 210 to perform process steps described herein. In alternative embodiments, hard-wired circuitry may be used in place of, or in combination with, software instructions for implementation of the processes of the present invention, as would be understood by those of skill in the art. Thus, embodiments of the present invention are not limited to hardware, software or any specific combination of hardware and software.

[0035] The storage device 230 also stores (i) a player database 250, (ii) a gaming device database 260, and (iii) a contract database 270. The databases are described in detail below and depicted with exemplary entries in the accompanying figures. As will be understood by those skilled in the art, the schematic illustrations and accompanying descriptions of the databases presented herein are exemplary arrangements for stored representations of information. A number of other arrangements may be employed besides those suggested by the tables shown. Similarly, the illustrated entries of the databases represent exemplary information only; those skilled in the art will understand that the number and content of the entries can be different from those illustrated herein. Based on the present disclosure many other arrangements of data will be readily understood by those of skill in the art.

[0036] FIG. 3 illustrates an embodiment 300 of an insurer device. The insurer device may be implemented as a dedicated hardware circuit, an appropriately programmed general-purpose computer, or any other appropriate device including without limitation electronic, mechanical or electromechanical devices. Accordingly, the insurer device need not include the various components depicted in FIG. 3.

[0037] The insurer device of the illustrated embodiment comprises a processor 310, such as one or more Intel® Pentium® microprocessors. The processor 310 is in communication with a communications port 320 and a data storage device 330. The communications port 320 allows the processor 310 to communicate with other devices, such as the casino server 110. The data storage device 330 comprises magnetic memory, optical memory, semiconductor memory or any combination thereof. The data storage device 330 may include, for example, Random Access Memory (RAM), Read-Only Memory (ROM), a compact disc and/or a hard disk. The processor 310 and the storage device 330 may each be, for example: (i) located entirely within a single computer or computing device; or (ii) connected to each other by a remote communication medium, including without limitation a serial port cable, a telephone line, a network connection

tion or a radio frequency transceiver. In some embodiments, the gaming device may comprise one or more computers that are connected to a remote server computer for maintaining databases.

[0038] The data storage device 330 stores a program 340 for controlling the processor 310. The processor 310 performs instructions of the program 340, and thereby operates in accordance with the present invention, and particularly in accordance with the methods described in detail herein. The program 340 may be stored in a compressed, uncompiled and/or encrypted format, as well as in a variety of other forms known in the art. The program 340 furthermore includes program elements that may be necessary, including without limitation an operating system, a database management system and "device drivers" for allowing the processor 310 to interface with peripheral devices. Appropriate program elements are well known to those skilled in the art, and need not be described in detail herein.

[0039] According to an embodiment of the present invention, the instructions of the program 340 may be read into a main memory from another computer-readable medium, such as into RAM from hard drive or ROM. Execution of sequences of the instructions in program 340 causes processor 310 to perform process steps described herein. In alternative embodiments, hard-wired circuitry may be used in place of, or in combination with, software instructions for implementation of the processes of the present invention, as would be understood by those of skill in the art. Thus, embodiments of the present invention are not limited to hardware, software or any specific combination of hardware and software.

[0040] FIG. 4 illustrates an embodiment 400 of a gaming device. Well-known examples of gaming devices include video poker, video blackjack, pachinko, mechanical slot machines and video slot machines. The gaming device may be implemented as a dedicated hardware circuit, an appropriately programmed general-purpose computer, or any other appropriate device including without limitation electronic, mechanical or electro-mechanical devices. Accordingly, the gaming device need not include the various components depicted in FIG. 4.

[0041] The gaming device of the illustrated embodiment comprises a processor 410, such as one or more Intel® Pentium® microprocessors. The processor 410 is in communication with a communications port 440 and a data storage device 450. The data storage device 450 comprises magnetic memory, optical memory, semiconductor memory or any combination thereof. The data storage device 450 may include, for example, Random Access Memory (RAM), Read-Only Memory (ROM), a compact disc and/or a hard disk. The processor 410 and the storage device 450 may each be, for example: (i) located entirely within a single computer or computing device; or (ii) connected to each other by a remote communication medium, including without limitation a serial port cable, a telephone line, a network connection or a radio frequency transceiver. In some embodiments, the gaming device may comprise one or more computers that are connected to a remote server computer for maintaining databases.

[0042] The data storage device 450 stores a program 460 for controlling the processor 410. The processor 410 performs instructions of the program 460, and thereby operates

in accordance with the present invention, and particularly in accordance with the methods described in detail herein. The program 460 may be stored in a compressed, uncompiled and/or encrypted format, as well as in a variety of other forms known in the art. The program 460 furthermore includes program elements that may be necessary, including without limitation an operating system, a database management system and "device drivers" for allowing the processor 410 to interface with peripheral devices. Appropriate program elements are well known to those skilled in the art, and need not be described in detail herein.

[0043] According to an embodiment of the present invention, the instructions of the program 460 may be read into a main memory from another computer-readable medium, such as into RAM from hard drive or ROM. Execution of sequences of the instructions in program 460 causes processor 410 to perform process steps described herein. In alternative embodiments, hard-wired circuitry may be used in place of, or in combination with, software instructions for implementation of the processes of the present invention, as would be understood by those of skill in the art. Thus, embodiments of the present invention are not limited to hardware, software or any specific combination of hardware and software.

[0044] The processor 410 may also be in communication with one or more input devices 420 and one or more output devices 430.

[0045] Examples of input devices include: a button; a touch screen; a handle; a player tracking card device, which performs functions related to player tracking cards, such as reading player tracking cards and communicating information read from such cards to the processor 410 (Typically, information read from such cards includes unique player identifiers, such as a sequence of digits or a sequence of alphanumeric characters); a ticket reader, which is capable of reading tickets and particularly indicia registered on tickets and like material; a credit card reader which generally allow a card such as a credit card or debit card to be inserted therein and information to be read therefrom.

[0046] Examples of output devices include: a cash dispenser, which dispenses coins and/or bills to players that have requested to have funds be dispensed; a ticket printer, which may be commanded to print onto a substrate, such as paper or other material; a display screen, such as a liquid crystal display, a plasma display and a video display monitor.

[0047] FIG. 5 illustrates an embodiment 500 of a player device, which may, for example, a TV or a personal computer. The player device may be implemented as a dedicated hardware circuit, an appropriately programmed general-purpose computer, or any other appropriate device including without limitation electronic, mechanical or electromechanical devices. Accordingly, the player device need not include the various components depicted in FIG. 5.

[0048] The gaming device of the illustrated embodiment comprises a processor 510, such as one or more Intel® Pentium® microprocessors. The processor 510 is in communication with a communications port 530 and a data storage device 540. The data storage device 540 comprises magnetic memory, optical memory, semiconductor memory or any combination thereof. The data storage device 540

may include, for example, Random Access Memory (RAM), Read-Only Memory (ROM), a compact disc and/or a hard disk. The processor 510 and the storage device 540 may each be, for example: (i) located entirely within a single computer or computing device; or (ii) connected to each other by a remote communication medium, including without limitation a serial port cable, a telephone line, a network connection or a radio frequency transceiver. In some embodiments, the player device may comprise one or more computers that are connected to a remote server computer for maintaining databases.

[0049] The data storage device 540 stores a program 560 for controlling the processor 510. The processor 510 performs instructions of the program 560, and thereby operates in accordance with the present invention, and particularly in accordance with the methods described in detail herein. The program 560 may be stored in a compressed, uncompiled and/or encrypted format, as well as in a variety of other forms known in the art. The program 560 furthermore includes program elements that may be necessary, including without limitation an operating system, a database management system and "device drivers" for allowing the processor 510 to interface with peripheral devices. Appropriate program elements are well known to those skilled in the art, and need not be described in detail herein.

[0050] According to an embodiment of the present invention, the instructions of the program 560 may be read into a main memory from another computer-readable medium, such as into RAM from hard drive or ROM. Execution of sequences of the instructions in program 560 causes processor 510 to perform process steps described herein. In alternative embodiments, hard-wired circuitry may be used in place of, or in combination with, software instructions for implementation of the processes of the present invention, as would be understood by those of skill in the art. Thus, embodiments of the present invention are not limited to hardware, software or any specific combination of hardware and software.

[0051] The processor 510 may also be in communication with one or more output devices 520.

[0052] Examples of output devices include: a ticket printer, which may be commanded to print onto a substrate, such as paper or other material; a display screen, such as a liquid crystal display, a plasma display and a video display monitor.

#### [0053] Player Database

[0054] FIG. 6 is a tabular representation 600 of the player database. The tabular representation 600 of the player database includes a number of example records or entries 680 and 685 each defining a player. Those skilled in the art will understand that the player database may include any number of entries. The tabular representation 600 also defines fields for each of the entries or records. The fields specify: (i) a player identifier 610 that uniquely identifies the player; (ii) a name 620 of the player; (iii) an address 630 of the player; (iv) a financial account identifier 640 of the player, which may be, e.g., a credit card, debit card or checking account number; (v) demographic data 650 about the player, such as the age, gender, income level of the player; (vi) credits 660 which the player has accumulated in one or more previous and current plays at one or more gaming devices; and (vii)

an indication of the aggregate amount 670 that the player has ever wagered, or that the player has ever deposited in a gaming device or made available for wagering at a gaming device.

[0055] Not all of the fields depicted in FIG. 6 are required, and various substitutions, deletions and other changes to the tabular representation will be readily apparent to those of ordinary skill in the art.

#### [0056] Gaming Device Database

[0057] FIG. 7 is a tabular representation 700 of the gaming device database. The tabular representation 700 of the gaming device database includes a number of example records or entries 740 and 745, each defining a gaming device. Those skilled in the art will understand that the gaming device database may include any number of entries. The tabular representation 700 also defines fields for each of the entries or records. The fields specify: (i) a gaming device identifier 710 that uniquely identifies the gaming device; (ii) a name 720 of the gaming device, which may additionally or alternatively specify the type of game(s) playable at the gaming device; and (iii) a manufacturer 730 of the gaming device.

[0058] Not all of the fields depicted in FIG. 7 are required, and various substitutions, deletions and other changes to the tabular representation will be readily apparent to those of ordinary skill in the art.

#### [0059] Contract Database

[0060] FIG. 8 is a tabular representation 800 of the contract database. The tabular representation 800 of the contract database includes a number of example records or entries such as the entry 895. Each record defining a contract that a player may agree to, and which may govern play at a gaming device accordingly. Those skilled in the art will understand that the contract database may include any number of entries. The tabular representation 800 also defines fields for each of the entries or records. The fields specify: (i) a contract identifier 810 that uniquely identifies the contract; (ii) a player identifier 820 that uniquely identifies a player who has agreed to the terms of the contract; (iii) an initial player bankroll 830 which sets forth the required initial amount, if any, which the player must provide; (iv) a description 840 of the contract; (v) a cost 850 which describes the cost, if any, of the contract to the gaming device (for e.g., its operator/owner); (vi) a result 860 at the end of the contract period, including, e.g., what amounts are owed to/by whom; (vii) an amount 870 owed to the player at the end of the contract; (viii) an amount 880 owed to the insurer at the end of the contract.

[0061] The tabular representation 800 of the contract database also may indicate a total amount 890 owed to the insurer, which may be calculated as the sum of the amounts 880 for all records.

[0062] Not all of the fields depicted in FIG. 8 are required, and various substitutions, deletions and other changes to the tabular representation will be readily apparent to those of ordinary skill in the art.

[0063] Referring to FIG. 9, an illustrative gaming device 900 includes an information area 910, which displays a message to the user that, at the end of the contract, positive credits may be withdrawn by the player. Gaming device 900

also includes a card reader 920 for reading, e.g., player tracking cards. A handle 930 is used for initiating plays, in a manner known in the art. A display area 940 provides information, such as a positive credit balance (e.g., what credits may be withdrawn by the player as funds), a negative credit balance (e.g., what amounts have been lost but need not be repaid by the player) and a time remaining (e.g., for play according to the terms of a contract as described herein).

[0064] Reels 950 display the outcome of a play in the form of a reel symbol on each reel. Buttons 960 allow the player to indicate wager amounts for an outcome. An indicator 970 indicates whether a contract is in force and play must proceed under the terms of a contract.

[0065] Referring to FIG. 10, another illustrative gaming device 1000 includes an information area 1010. Gaming device 1000 also includes a card reader 1020 for reading, e.g., player tracking cards. A handle 1030 is used for initiating plays, in a manner known in the art. A display area 1040 provides information, such as a credit balance and a number of spins (i.e. plays or outcomes) remaining (e.g., for play according to the terms of a contract as described herein).

[0066] Reels 1050 display the outcome of a play in the form of a reel symbol on each reel. Buttons 1060 allow the player to indicate wager amounts for an outcome, and a "USE SPIN" button allows the player to indicate when another of the remaining spins (i.e. plays) is to be used.

#### [0067] Process Description

[0068] In general, a method according to an embodiment of the present invention allows payment to be received from a player in exchange for a predetermined number of outcomes at a player device (such as a gaming device, television, web terminal, etc.). The predetermined number may be expressed as a number, or in terms of a combination of a minimum time (e.g., an hour) and minimum rate of play (no less than six plays per minute).

[0069] Further restrictions of a like nature may be that the player may not receive more than a maximum number of outcomes, the player must play for a certain minimum time period, the player must play for less than a certain maximum time period, the player must maintain a minimum rate of play, the player may not exceed a maximum rate of play, the total amount of funds inserted for use in game plays ("coin in" over the duration of the contract must exceed a certain minimum amount, and the total coin in over the duration of the contract must not exceed a certain amount.

[0070] Further restrictions of a like nature may be that the player may not receive more than a predetermined number of winning outcomes, the player may not receive more than a predetermined number of particular outcomes, the player may not receive more outcomes until a condition is met.

[0071] The player device generates at least the predetermined number of outcomes, and adjusts a balance of the player device based on the outcomes. Generally, the balance is increased according to winning outcomes and decreased according to wager amounts and (in some embodiments) losing outcomes. The player may be allowed to play, regardless of whether the balance decreases below zero.

[0072] In some embodiments, there may be established an agreement between a player, an insurer, and/or a casino. Terms of such a contract may include any or all of the following:

[0073] 1. The player pays the insurer a fixed amount in advance.

[0074] 2. The player must make a predetermined number of plays or outcomes (perhaps no more as well as no less).

[0075] 3. The player need not pay any additional money after purchasing the contract.

[0076] 4. The player keeps any net winnings after all outcomes have been generated.

[0077] 5. If the player has a net loss (e.g., negative balance) after the outcomes have been generated, then the loss is paid to the casino by the insurer.

[0078] Many variations of these terms and additional terms will be readily apparent and many are further discussed in detail herein. The contract can serve to insure a player against excessive losses, and may give the player more outcomes than would otherwise be possible for the price of the contract. For example, a player wishing to make six hundred plays at a quarter slot machine would ordinarily require \$150 (25 cents×600) in order to assure himself the ability of completing the six hundred plays. However, a contract might allow a player to make six hundred plays by paying only, e.g., \$20.

[0079] Also, in some embodiments since there might be no additional player decisions required after the player has purchased the contract. For example, the player may not need to be present for the execution of the contract (plays) and may therefore experience the feeling of remote gambling.

[0080] Referring to FIG. 11, a flow chart 1100 represents an embodiment of the present invention that may be performed by a gaming device and/or the casino server 110 (FIG. 1) to execute in accordance with a contract. The particular arrangement of elements in the flow chart of FIG. 11, as well as the other flow charts and processes discussed herein, is not meant to imply a fixed order to the steps; embodiments of the present invention can be practiced in any order that is practicable.

[0081] At step 1110, a gaming device receives a payment from a player for a predetermined number of handle pulls (or other indications of an outcome). Typically, the payment is inserted into the gaming device as tokens, coins and/or bills. At step 1120, the payment is transmitted to an insurer, typically via an insurer device.

[0082] At step 1130, the gaming device generates a number of outcomes sufficient to satisfy the predetermined number of handle pulls required by the terms of the contract. At step 1140, the credit balance is adjusted according to these outcomes, typically by increasing the balance for winning outcomes and reducing the balance for losing outcomes. As is well known, the adjusting of a balance typically occurs after each outcome, but may occur at other times.

[0083] In the depicted embodiment, if the accumulated credits of the credit balance exceed a predetermined thresh-

old (step 1150) then the player is paid the amount by which the accumulated credits exceed that threshold (step 1180). Otherwise, the amount by which the accumulated credits fall short of that threshold are collected from the insurer (step 1170).

[0084] In some embodiments, the contract does not involve an insurer at all. The contract may merely allow outcomes to be generated for the player while the player is not physically present at the gaming device. In such an embodiment, the contract defines instructions from the player as to how the slot machine should play on the player's behalf. For example, the instructions will tell the machine how fast to play (e.g., outcomes per minute), when to quit (e.g., when the balance is less than twenty credits), and then where to send winnings (e.g., to a hotel bill, to a bank account).

[0085] Further variations in the terms of the contract are contemplated. For example, a contract may specify the size of the wager for each pull. The wager size may be the same as that typically used by the gaming device. For example, if a player signs up for a contract at a quarter slot machine, the wager for each pull of the contract might be a quarter. If the slot machine has multiple slots, the wager for each pull might be a quarter, 50 cents, 75 cents etc. The contract may allow or may force the player to vary the wager from pull to pull.

[0086] One aspect of a contract may allow all play to occur in "credit mode." That is, the player need not physically insert money into the gaming device prior to each pull, and money need not come out of the gaming device after a player win. Rather, a player's credit balance may be stored in a player database (FIG. 6) either in the gaming device or in the casino server. Every time the player then makes a handle pull, credits are deducted from the player's balance. Every time the player wins, credits are added to the player's balance. The player's credit balance can be displayed on the device so that the player may track his progress.

[0087] Since play may occur in credit mode, each wager might consist of coin denominations that are not standard for the gaming device. For example, a device that typically handles quarters may accept wagers of a nickel, of 40 cents, or even of 12½ cents.

[0088] The following are several examples which illustrate additional embodiments of the present invention. These examples do not constitute a definition of all possible embodiments, and those skilled in the art will understand that the present invention is applicable to many other embodiments. Further, although the following examples are briefly described for clarity, those skilled in the art will understand how to make any changes, if necessary, to the above-described apparatus and methods to accommodate these and other embodiments and applications.

[0089] According to one embodiment of the present invention, a contract may describe some threshold of gross winnings (the total of a player's winning amounts during the duration of a contract, not subtracting amounts wagered by the player), net winnings (gross winnings minus amounts wagered by the player), or accumulated player credits above which the player keeps any excess. Gross winnings describe the accumulated player wins from each pull of the contract. Thus, a player who makes 600 pulls on a \$1 slot machine as

part of a contract and wins \$3 on each of 100 pulls has gross winnings of \$300 (\$3/pull×100 pulls). Net winnings are the gross winnings minus the accumulated costs of wagering. In the above example, the accumulated costs of wagering are \$600 (\$1/pull×600 pulls). Thus, in the above example, the player's net winnings would be negative \$300 (\$300-\$600). Accumulated player credits may mirror a running tally of a player's net winnings. For example, a player may begin with zero credits, with credits deducted in the amount of any wager, and added in the amount of any winnings. Accumulated player credits may also mirror a running tally of gross winnings, or any other statistic about a player's performance.

[0090] At the end of a contract, a player's accumulated credits may be compared to a threshold. The player may then receive a payout of any excess accumulated credits above the threshold. For example, if the threshold is zero, and the player has 44 credits, each credit representing 25 cents, then the player receives a payout of \$11 (44 credits×25 cents/credit). If the player had -12 credits, indicating a net loss of 12 credits, then the player receives nothing. The player does not owe \$3 because the contract does not make the player responsible for any losses.

[0091] The threshold might be at, e.g., ten credits, in which case a player with accumulated credits of thirty would receive a payout equivalent to twenty credits at the end of a contract, and a player with six credits would receive nothing. Further, with a threshold of negative ten credits, a player with accumulated credits of negative six would receive the equivalent of four credits, while a player with negative one hundred credits would receive nothing.

[0092] Rather than insuring against all of a player's losses, a contract might insure all losses up to a point and not beyond. Therefore, a contract may have multiple thresholds, each with different functions. A player may, for example, be responsible for any losses beyond a threshold loss of 100 credits. The same player might receive any winnings beyond a threshold of 10 accumulated credits. Thus, if, at the end of the contract, the player has accumulated -125 credits, then the player must pay 25 credits. If the player has accumulated 33 credits, then the player receives a 23 credit payout. If the player has accumulated -49 credits, then the player neither owes nor receives anything.

[0093] In some embodiments, a threshold delineates a change in the percentage of a player's winnings or losses between credit tallies above and below the threshold. For example, a player might keep any credits won beyond a threshold of 50. Below 50 credits, the player only keeps 80% of his winnings. Therefore, if a player has 70 credits remaining at the end of a contract, he keeps all 20 credits above 50, and he keeps an additional 40 credits, representing 80% of the first 50 credits. Therefore, the player keeps 60 credits in total.

[0094] A player may also be responsible for a percentage of losses above or below a certain threshold. For example, a player may be responsible for 50% of losses over 10 credits. Thus, a player who finishes a contract with minus 20 credits owes nothing for the first 10 credits of loss, but owes 5 credits for the next 10 credits of loss. The player therefore owes 5 credits.

[0095] In the most general sense, a contract specifies a functional relationship between what a player's accumulated

credits are at the end of the contracted number of pulls, and what the player either owes or is due. The function may be piece-wise linear, or may be rather non-linear and convoluted.

[0096] Where there is potential for a player to owe money at the end of a contract, the player may be required to deposit money into the gaming device in advance so as to discourage the player from walking away when he owes money. The advance payment may later be returned if the player turns out to owe nothing at the end of the contract.

[0097] In many embodiments, a contract is "transparent" to the casino. In other words, if the player makes a certain number of handle pulls, the casino makes the same amount of money whether or not the player happened to be involved in a contract. In these embodiments, however, a casino may collect money that it makes (and the player has lost) from the insurer, rather than from the player. The casino may also act as an intermediary in transactions between the player and the insurer. For example, the casino may collect from the player money that is meant to pay for a contract. The casino may then transfer an equivalent amount of money to the insurer.

[0098] In other embodiments, a contract is not "transparent" to the casino. That is, the amount of money a casino receives after a certain number of the player's handle pulls may depend on whether or not the player was in a contract. In one example, a casino agrees that if a player's accumulated credits at the end of a contract are less than -200, then the casino will only collect 200 credits for the contract's handle pulls. This example may benefit the insurer, since the insurer doesn't have to worry about covering player losses in excess of 200 credits. In another example, the casino configures a gaming device to give different odds to a player in contract play versus a player not in contract play.

[0099] In one version of a contract, a player pays a fixed amount upfront, say \$30. The gaming device then puts a credit balance on the gaming device. The credit balance may or may not be equal to the amount of money the player has paid upfront. In general, the player will not be allowed to cash out the credit balance until the end of the contract. Even then, the player may not receive the number of credits displayed on the credit balance. For example, the player may only receive the difference between the credit balance and a predetermined threshold.

[0100] During the course of the contract, the player may be allowed a fixed number of pulls, or a fixed amount of time in which to make as many pulls as he can. A player may receive some combination of a fixed amount of time and a fixed number of handle pulls, e.g., the player may make as many pulls as he can for the first hour, and then 100 pulls thereafter.

[0101] In this embodiment, each handle pull costs a credit, or costs multiple credits if the player plays multiple lines, or bets multiple credits per line. The credit or credits for the handle pull are deducted from the credit balance. If the handle pull results in the win of credits, such credits are added to the credit balance. Credits that are won typically do not go into the coin tray.

[0102] One aspect of this contract is that a player's credit balance may go negative. For example if a player has zero credits, and places a wager for a handle pull, then the credit balance goes to -1. Although a negative credit balance is not

typical, all that it means, in this case, is that, during the contract, more credits have been deducted from the credit balance in order to initiate handle pulls than have been added to the credit balance as a result of winning handle pulls. This assumes, of course that the credit balance did not start out negative. The possibility of a negative credit balance provides an advantage for players in contract play. For one, a player can continue playing after his credit balance has gone to zero, without the need to insert new money. This is not the case in the typical course of play. Additionally, in many embodiments, the player will not be responsible for reimbursing the casino for a negative credit balance. Thus, in one sense, a player with a negative credit balance is playing for free.

[0103] Since it is unconventional for a slot machine to show a negative credit balance, several methods of doing so are described below:

[0104] A negative credit balance is indicated using a negative sign. For example negative 10 is written "-10".

[0105] A negative credit balance is indicated by enclosing the magnitude of the balance in brackets. For example, "(10)".

[0106] A negative credit balance is indicated by showing the magnitude of the balance, together with a red light, a border, text, or some other indicator of negativity. For example when a player has negative 10 credits, the gaming device may display "10" and additionally have a red light on. Alternatively, the gaming device may display "10" and backlight text which says, "Negative".

[0107] A negative credit balance is indicated in a different color than a positive credit balance. For example, a negative balance may be shown in red, and a positive balance in green.

[0108] A negative credit balance may be shown pictorially. For instance, a balance of negative 10 is shown as a hole 10 units deep, whereas a balance of positive 10 is shown as a pile 10 units high. A negative balance may also be illustrated as a number below a horizontal line, and a positive balance may be shown as a number above the horizontal line.

[0109] A negative credit balance may be shown as blinking, faded, italicized, in smaller font, etc.

[0110] A negative credit balance may be shown in a separate area or on a separate display from where a positive credit balance is shown. For example, a first LCD display is used for displaying the amount of any positive credit balance, and a second LCD display is used for showing the magnitude of any negative credit balance. When there is a negative credit balance, the display of the positive credit balance may read "0" or may simply be blank. Similarly, when there is a positive credit balance, the display of the negative credit balance may read "0" or may simply be blank. FIG. 9 illustrates a gaming device containing two displays for credit balances, one for a positive credit balance and one for a negative credit balance. In the figure, the player currently has -33 credits. The positive credit balance display reads, "0", and the negative credit balance display reads, "33".

[0111] The presence of negative credit balances may further necessitate arithmetic involving negative numbers.

Such arithmetic may be confusing, especially when a player is not paying too much attention to his balances. At first glance, upon winning a 10-coin payout, a player with a negative credit balance might be surprised to see the magnitude of his balance going down, e.g., from -9 to -8, to -7, etc., even though he has won. A player may similarly be surprised to see his balance go from -6 to 4 upon the win of 10 coins. It might appear at first glance as if the player has lost 2 coins.

[0112] The presence of two separate balances may illustrate the player's standing in a convenient format. When a player with a balance of -6 wins 10 credits, his negative balance display is zeroed out, and then his positive balance display goes to 4. A player should then be less likely to experience confusion when a single balance appears not to change much, or appears to go in the wrong direction.

[0113] The pictorial display of negative balances may also help to alleviate confusion. When a player with a balance of -9 (a hole 9 units deep) wins a 20 coin payout, 20 bricks can be added to the pictorial display. The first 9 bricks fill in the hole, and the next 11 bricks stack on top of the filled hole. Thus, it appears that 20 units have been given to the player.

[0114] In one embodiment, when a payout will bring a player from being in the negative to being in the positive, the payout is made to the player with a distinct pause when the player's credit balance gets to zero. For example, a player with a balance of -6, who wins 10 credits, may first receive 4 credits. Then there may be a pause. Then the player may receive his last 6 credits. The pause gives the player time to adjust from seeing the magnitude of his negative balances decrease, to seeing his positive balance increase.

[0115] The gaming device may also accompany the payment of credits with a message. The message may say for example, "Paying back borrowed credits." Then once the negative balance has been zeroed out, a new message may appear, "Adding new credits," or something to that effect.

[0116] One way to handle confusion with negative credit balances is to try to avoid them entirely. In one variation of a contract, a player pays \$50 to begin with. He then begins with a credit balance of \$0. The player could just as easily begin with a different credit balance, but it may seem more fair to a player that he begin with a credit balance equal to the amount of money he has paid. Now, the contract specifies that after 400 pulls, the player will keep any positive credit balance remaining. In addition, the contract guarantees that the player will receive at least \$30 back. So, if, at the end of the contract period, the player's credit balance is only \$5, the player still gets back \$30. The question is, why not just charge the player \$20, let him start with a credit balance of 20, and allow him to keep the amount of any positive credit balance? The two contracts would be mathematically equivalent, as the player would not lose more than \$20 in either case. However, the first contract has an advantage in that, by starting the player at 50 credits, the player is less likely to lose enough credits to go negative. By keeping a positive credit balance, the player is less likely to be confused with negative numbers and with negative arithmetic. The first contract also has another psychological advantage. Namely, the player will always get something back (i.e. his \$30), whereas in the second contract, the player may get nothing back.

[0117] The first contract described above can be further sweetened by guaranteeing the player not only \$30 of his

\$50 back, but also guaranteeing the player a coupon, voucher, or gift certificate for a product or service, the coupon having \$20 face value. The player then perceives that he is guaranteed to recover the full amount of his payment, in the form of cash and other benefits, and has the further opportunity to win much more. The casino can afford to give away a \$20 coupon, voucher, or gift certificate, because the casino may have excess inventory that it is willing to sell at a discount, may have high priced products for which a \$20 discount would have little impact, may have products or services which cost it very little anyway, etc. Casino products or services may include nights at the casino's hotel, meals at the casino's restaurant, products from the casino's gift shop, tickets to the casino's show, etc. In addition, the coupon, voucher, or gift certificate may be provided by a third-party merchant. The merchant may be more than happy to give the player free or discounted products or services just to acquire the player as a customer. In fact, the merchant might even pay the casino to give away its certificates. The player, upon receiving such a certificate as a perceived recompense of his payment for the contract, will be very motivated to actually use it, thereby increasing the likelihood that the third party merchant would acquire a new customer.

[0118] With the use of coupons, vouchers, etc., a casino might also be able to justify starting a player at a credit balance below what the player has paid for the contract. For example, the player may pay \$50 to enter into a contract where he starts at a \$30 credit balance. The player may perceive this to be unfair, even though the fact that he cannot lose more than \$50 within a large number of pulls confers upon him a significant advantage. Therefore, a contract may require a player to pay \$50, but may provide a \$20 gift certificate to the player, and start the player off at a \$30 credit balance.

[0119] Of course, the starting amount of a player's credit balance, together with the face value of a gift certificate provided to the player, need not necessarily add up to the amount a player pays for the contract. For example, a player might pay \$50, start with a credit balance of \$40, and receive a \$30 gift certificate. Similarly, a player need not be guaranteed to get back a value equal to what he paid initially. For example, a player may pay \$50 to enter into a contract, and may be guaranteed a minimum of \$20 back and a \$20 gift certificate.

[0120] Returning to the subject of negative credit balances, another way to eliminate them is to change the rules of play once the player's credit balance gets to zero. In one embodiment, when the player's credit balance hits zero, normal play is halted and the player can only spin for the jackpot. Thus, a win of 10 coins does not increase the player's credit balance, and the cost of a handle pull does not decrease his balance. Rather, the only outcome that benefits the player is hitting the jackpot. If the player does hit the jackpot within the time or the pulls remaining on his contract, he may keep the jackpot. Otherwise, he will only receive a guaranteed minimum amount specified in his contract, e.g. \$30. Of course, a player whose balance reaches zero may be allowed more outcomes than just the jackpot. For example, the player may be allowed to win any of the top three outcomes.

[0121] Still another way to handle negative credit balances, though the embodiment is not limited to negative



credit balances, is to hide or obscure the amount of a player's credit balance. For example, rather than displaying to a player a numerical representation of his credit balance, the gaming device may instead display a shade of color. The shades of color may be approximately correlated to actual credit balances. For example, colors like violet and blue may be associated with high credit balances, while colors at the other end of the visible spectrum, such as red and orange, may represent relatively low credit balances. So, for example, if a player saw a color such as yellow, orange, or red displayed on his gaming device, he might realize that he was in the negative. However, he need never be confused with the presence of a negative sign, nor with changes from negative to positive numbers. It will be appreciated that there are many distinguishable gradations of color, brightness, hue, etc., each of which may be used to represent a credit balance. In addition, varying credit balances may be represented by progressively darker textures, by the position of a needle on a meter, by the angle of a dial, by the brightness of a light, by the pitch of a tone, by the loudness of a tone, etc. Another representation of a credit balance would be a pile of coins, diamonds or other items. Each coin in the pile might represent a credit, or a fraction of a credit. With a large number of coins piled together, the player would not be able to tell exactly how many coins were in the pile. Another representation of a credit balance involves a bag, such as a bag of money, that swells or shrinks depending on how much money is in the bag, equivalent to how many credits the player has left.

[0122] The concealment or obfuscation of the actual value of a player's credit balance may serve another purpose. Suppose that a player is engaged in a contract in which he will receive any positive credit balance remaining at the end of the contract. If the player's credit balance now reads -300, the player may become discouraged, feeling he has little chance to bring his credit balance back into the positive range. However, if the player's credit balance were represented by a shade of color, the player might not be so sure of how negative he was, and might become less discouraged. Another benefit of the concealment of a credit balance is that a player may, in good faith, represent to friends or family that he is "about even", since he would not necessarily be able to tell from the shade of his credit balance meter that he was down 10 coins. Therefore, the concealment of a credit balance can alleviate embarrassment. The concealment of a credit balance may also allow a player to postpone any anguish associated with losses. Until the player sees the actual amount of money that he has lost, he may maintain the illusion that his losses are not so bad. In this way he may better enjoy his experience. Note once again that the concealment of a credit balance need not occur only in the context of contract play. A player who plays in standard fashion may insert a \$100 bill and begin with a green credit balance. The credit balance may change colors, moving up or down the visible spectrum, depending on how the player fares. Only if the player runs out or money may the gaming device actually reveal the player's credit balance, since, at that point, the player would no longer be able to continue spinning without inserting new money, and the illusion would be up. Also note that the player may always be given the option to see the exact amount of his credit balance. For example, at any time the player may press a "show balance" button, at which time his gaming device may switch the balance meter from displaying a color to displaying an

actual number. Therefore, it may be completely up to a player as to whether he wants to maintain for himself any illusions about how much money he has won or lost.

[0123] In the context of the present embodiment, in which a player has a credit balance that can increase or decrease, and in which the player will keep the amount of any positive credit balance at the end of the contract period, some anxious situations may arise for the player. For example, the player might reach a point where his credit balance stands at 250, but where he has 300 pulls remaining in the contract. The player may be quite happy with his current credit balance, but worried that his credit balance will decrease significantly within the next 300 pulls. Therefore, in some embodiments, the player may take some measure to protect his current credit balance. For example, the player may signal to the gaming device that he does not want to receive less than his current credit balance at the end of his contract. As a result of the player's signal, the player may receive a minimum of his current credit balance at the end of a gaming contract, even if his balance ends up below its current level. If the player's credit balance rises above the level at which he sought protection, the player may receive the higher credit balance. Protecting a credit balance of a certain level will be termed "banking" at that level. For example, by banking a credit balance at a level of 100, a player ensures that he will receive the benefit of at least a 100-credit balance, whatever that benefit happens to be in the context of the contract.

[0124] A number of restrictions may apply as to when a player may bank, and as to the level at which a player may bank. Exemplary restrictions are listed below:

[0125] A player may only bank at a certain percentage of his current credit balance. The percentage might be 100%, 50%, 33%, etc., or even percentages above 100%. For example, if a player may only bank at 50% of his credit balance, then a player with a balance of 200 may bank at the 100 level.

[0126] The player may only bank a limited number of times during the course of a contract. For example, a player might be allowed to bank only once during a contract. The player would then be faced with a strategic decision as to when to bank. A player might bank at a level of 100 credits, but in doing so may lose the opportunity to bank at a later time, when he might bank at a higher level, and thereby protect a larger credit balance. On the other hand, if the player does not bank at a certain level, his credit balance may decline and he would not have the benefit of protection at the higher level.

[0127] The player may only bank within a given time period or within a given number of bundle pulls of the start of a contract period. Similarly, the player might be allowed to bank only within a given time period or within a given number of bundle pulls of the end of a contract period.

[0128] The player may only bank at a specific time, or set of times. For example, the player may only bank either 15 minutes, 30 minutes, or 45 minutes into a contract period, but at no other time. Similarly, a player might be allowed to bank only on specific handle pulls. For example, the player may only bank after the 100<sup>th</sup>, 200<sup>th</sup>, or 300<sup>th</sup> spins, and at no other time.

[0129] The player may bank at only up to a maximum level. For example, no matter what his credit balance, a player may never bank at a level above 100.

[0130] In some embodiments, the ability to bank may be the only significant feature of a contract. For example, a contract may specify that a player can play for 100 pulls, using his own money to wager on each bundle pull. At any point, the player may choose to bank his current winnings. Once the player has banked, he is effectively insured against any losses that go below the level at which he banked.

[0131] One version of a contract allows a player to initiate a bundle pull without placing a wager and without having any amount deducted from his credit balance. In this way, over the course of a contract, a player's net winnings can only go up. For example, in a contract, a player may begin with a zero credit balance. The player may then be allowed 100 spins without placing any wagers. Any winning outcomes cause his credit balance to increase, while any non-winning outcomes do not affect his credit balance.

[0132] The expected size of a player's credit balance at the end of the contract described above may be readily calculated as the gaming device denomination multiplied by the payback percentage of the gaming device multiplied by the number of spins the player is allowed. Thus, if a \$1 denomination gaming device pays back 95%, or an average of 95 cents for every dollar wagered, then the player's average balance after 100 spins would be  $\$1 \times 95\% \times 100 = \$95$ . Therefore, the price that a player might have to pay to

player gets the same amount of entertainment for a fraction of the upfront outlay. A further advantage of a contract at a gaming device with a reduced payback percentage, is that the payback percentage of a gaming device may be reduced by reducing the winnings paid for outcomes that the player regards as unimportant. For example, a player may not regard an outcome of "cherry-any-any", with a payout of \$2, as very important, even though the outcome "cherry-any-any" makes up a significant portion of the payback percentage of the gaming device. Instead, the player may only be concerned with relatively high paying outcomes, such as jackpot outcomes. However, high-paying outcomes often make up a relatively small portion of a gaming device's payback percentage. Therefore, in one embodiment, the player may enter into a contract in which he does not pay for each spin during the contract, in which the payback percentage of the gaming device is reduced by reducing the payouts associated with low-paying outcomes, and in which the payouts associated with high paying outcomes are maintained. In one particular embodiment, a player may enter into a contract in which he may win only the jackpot on any spin.

[0134] Below is an example of the reduction of the payback percentage of a gaming device. In this example, the slot machine begins with the following payout structure, taken from "Winning At Slot Machines", by Jim Regan:

TABLE 1

Out- come	0	2	2	5	5	5	20	10	10	20	14	14	20	18	18	20	50	100
Hits	8570	680	680	200	200	68	20	42	6	42	20	5	50	4	20	20	20	1

enter into such a contract would likely exceed \$95. For example the player might pay the casino \$98 to enter into a contract for 100 spins without having to pay for spins individually. As a result of the contract, the player would receive an average of \$95, and therefore the casino would profit by an average of \$3.

[0133] Examination of the formula for a player's expected winnings at the end of a contract where he does not wager prior to each spin, reveals that the player's expected winnings may be reduced if the payback percentage of the gaming device is also reduced. For example, if a \$1 denomination gaming device paid back only 30%, then a player would make an average of \$30 after 100 spins. Therefore, in one embodiment, a player may enter into a contract in which he does not pay for any wagers, but in which the payback percentage of the gaming device is reduced from its typical value. The advantage for the player is that the price of the contract may be much smaller. Now, for example, rather than paying \$98 to enter into a contract for 100 spins, the player need only pay \$35 for a contract for 100 spins. The

[0135] In the table, "Outcome" represents the number of tokens paid, and "Hits" represents the number of times the corresponding outcome would be expected to occur in 10,648 spins, or a complete cycle of the slot machine. The probability of each outcome occurring on a single spin can be found by dividing the "Hits" entry by 10,648. For example, the probability of the outcome that pays 100 tokens appearing on a single spin is  $1/10,648 \approx 9.39 \times 10^{-5}$ .

[0136] If a player inserts a single token into the slot machine, his expected winning are given by:

[0137]  $EV = 0 \cdot 8570/10,648 + 2 \cdot 680/10,648 + 2 \cdot 680/10,648 + 5 \cdot 200/10,648 + \dots + 100 \cdot 1/10,648 = 0.945$

[0138] Therefore, for every token the player inserts, he can expect to receive 0.945 tokens back, making for a payback percentage of 94.5%.

[0139] Suppose the payback percentage is reduced. The payouts of outcomes paying less than 20 are reduced to zero, while the payouts of outcomes paying 20 or more are kept the same. The payout structure now looks like the following:

TABLE 2

Out- come	0	0	0	0	0	20	0	20	0	20	0	20	0	20	0	50	100
Hits	8570	680	680	200	200	68	20	42	6	42	20	5	50	4	20	20	1

[0140] Now, if a player inserts a single token into the slot machine, his expected winnings are given by:

$$[0141] \text{EV} = 0^*8570/10, 648 + 0^*680/10, 648 + 0^*680/10, 648 + 0^*200/10, 648 + \dots + 100^*1/10, 648 - 0.351$$

[0142] Therefore, for every token the player inserts, he can expect to receive 0.351 tokens back, making for a payback percentage of 35.1%. Of course, in the case of the contract under discussion, a player will not insert a token prior to every pull. However, he will still receive an average of \$35.10 cents for every pull, or equivalently, an average of \$35.10 after 100 pulls. Note how the payback percentage of the gaming device has been reduced from 94.5% to 35.1%, even though the probabilities of each outcome occurring have not changed, and the payouts for the six highest outcomes have not changed. If payouts for all the outcomes, except for the outcome paying 100, were reduced to zero, then the expected winnings on a single handle pull would be given by:

$$[0143] \text{EV} = 100^*1/10, 648 - 0.00939$$

[0144] Thus, the payback percentage would be less than 1%. Therefore, a player could purchase a contract for 100 spins for only \$1, and the casino would still make a profit, on average.

[0145] In one embodiment, a player might have a choice of contracts where the gaming device has a different payback percentage in each. Each contract may allow the player a different number of spins, depending on what the payback percentage is. For example, for \$100, a player might get 100 spins at 95% payback, 200 spins at 48% payback, or 300 spins at 32% payback.

[0146] One possible drawback of gaming devices with reduced payback percentages is that the player will likely not win very often. For example, with the payout structure described above, in which only the six highest paying outcomes continue to pay, the number of hits per cycle of winning outcomes would be:  $20 + 42 + 50 + 20 + 20 + 1 = 153$ . With a cycle of 10648, the player would win an average of once every 10648/153 spins, or about once every 70 spins. In fact, in almost 24%  $(= (10648 - 153)/10648)^{100}$  of contracts of 100 spins, the player would not win on any spin.

[0147] A player's frequency of obtaining winning outcomes may be increased, while maintaining a low payback percentage of a gaming device, if outcomes are introduced that take away from a player's credit balance. Such outcomes will be termed "negative outcomes", which are distinct from non-winning outcomes. Typically, at a gaming device, the only way for a player to lose money or to lose credits is to make a wager on a handle pull. If the handle pull is non-winning, then the player has lost the amount of his wager. However, no additional amounts are deducted from the player's credit balance. If the player has not paid for the wager in the first place, then a player would typically have no way of losing money on a handle pull, no matter what the outcome. Thus, negative outcomes are distinct from non-

winning outcomes in that negative outcomes actually do cause a player to lose money from a credit balance. For example, a player might have a credit balance of 60, achieve a negative outcome of -15, and then have a credit balance of 45.

[0148] In one embodiment, negative outcomes cause a player to lose a fixed percentage of his credit balance. For example, a negative outcome may take away 50% of a player's credit balance. A player with a balance of 40, upon attaining such a negative outcome, would end up with a balance of 20. Negative outcomes may take away other percentages, such as 10%, 33.3%, 66.7%, 75%, or 100% of a credit balance. If a negative outcome would take away a fractional credit, then the number of credits to be taken may be rounded either in favor of the casino or in favor of the player. For example, if a player has a balance of 11, and he receives a negative outcome that takes away 50%, then the player may end up with either 5 or 6 credits, depending on the rules of rounding that are applied. One benefit of negative outcomes that take away a percentage of a player's credit balance, is that, so long as a player is not using up a credit to initiate each handle pull, the player's credit balance cannot go negative. For example, a player's credit balance may be cut in half 10 times in a row, but dividing a positive number by 2 will never make the number go negative. In some embodiments, however, a player's credit balance is allowed to go to zero. For example, a player with a single credit may go to zero if he gets a negative outcome that takes away 50% of a balance, even though fractional credits would normally be rounded in favor of the player.

[0149] The magnitude of a negative outcome may have a more complicated functional dependence upon a player's credit balance. For example, if the player's credit balance is 100 or less, then a negative outcome takes away 50% of the balance. However, if the player's credit balance is more than 100, the negative outcome takes away only 33% of the player's credit balance.

[0150] Negative outcomes may be depicted with the addition of new symbols to existing gaming devices. For example, "thief" symbols could be added to the reels of a gaming device. Then, a negative outcome would be indicated by the appearance of at least two thief symbols across a pay line. Alternatively, existing symbols of a gaming device could be used to indicate negative outcomes. For example an ordinarily meaningless symbol combination, such as lemon-bell-bar, might represent a negative outcome. In some cases, one or more blanks may represent a negative outcome.

[0151] The following example illustrates how the use of negative outcomes can allow a player to win more frequently, without changing the payouts of outcomes, and without altering the payback percentage of the gaming device. The payout structure of a typical slot machine, taken from "Winning At Slot Machines", is once again reproduced below:

TABLE 3

Out- come	0	2	2	5	5	5	20	10	10	20	14	14	20	18	18	20	50	100
Hits	8570	680	680	200	200	68	20	42	6	42	20	5	50	4	20	20	20	1

[0152] The win frequency of a slot machine may be defined as the percentage of handle pulls in which the player can expect to achieve a winning outcome. The win frequency may be derived by summing the number of hits for a winning outcome that are contained within a cycle, by the total length of the cycle. In the case of the above payout structure, the win frequency is:

[0153]  $(\#Hits \text{ for first outcome paying } 2 + \#Hits \text{ for second outcome paying } 2 + \dots + \#Hits \text{ for outcome paying } 100) / (\text{Length of cycle}) - (680 + 680 + \dots + 1) / 10648 - 19.5\%$

[0154] Now, the above payout structure will be modified to include the addition of a negative outcome. The new payout structure is as follows:

TABLE 4

Out- come	0	-10	2	2	5	5	5	20	10	10	20	14	14	20	18	18	20	50	100
Hits	3386	864	5000	680	200	200	68	20	42	6	42	20	5	50	4	20	20	20	1

[0155] The new payout structure includes a negative outcome that causes a player to lose 10 coins from his credit balance. Note also that the new payout structure allows the first outcome paying 2 to occur much more often than it had. The outcome now occurs on 5000 hits of the cycle, whereas previously it had occurred on just 680 hits of the cycle. The win frequency can be shown to have increased to approximately 60.1%. Meanwhile, the payback percentage of the gaming device has not changed. A payout structure such as the one above may prove to be more exciting to a player, since he now wins more often than he had with the original payout structure.

[0156] Note that the new outcome could also have been made, for example, a "lose 50% of your balance" outcome. Then, the above payout structure would be accurate only when the player had a balance of 20 coins. Otherwise, the gaming device would have a different payback percentage than 94.5%.

[0157] A potential drawback of contracts in which a player only wins money, and does not pay the cost of handle pulls, is that the player may accumulate money so rapidly that the contract must be priced very highly in order to assure a casino profit. Some remedies to this drawback have been described above. Another possibility is that a player must first transition into a state (i.e., a prequalification) in which he can win, before he is actually allowed to win. An analogy can be taken from the game of volleyball. In volleyball, the defending team may win the rally, but not score a point. As a result of winning the rally, the defending team gets the ball. Only when a team starts out with the ball can it actually score points. Similarly, on a gaming device, a player might first need to obtain a winning outcome, or some other outcome which transitions the player into a new state, where he can actually win credits. Then, if the player does not achieve a winning outcome, the player may exit the state in which he can win credits. In this way, the player's accumulation of money is greatly reduced.

[0158] In some embodiments, a period of time, or a number of pulls during which the player can only win, and in which pulls cost the player nothing, is provided to the

player as a prize or reward. For example, the player may win a bonus outcome, which allows him to spin for two minutes, without inserting any new money, and keep any winnings from the two minutes. The two minutes of free spins may or may not be at a reduced payback percentage. In fact, they may be at an even higher payback percentage.

[0159] Taxes

[0160] In one embodiment, a player does not fully pay upfront for the benefits conferred by a contract. Rather the player may pay in the form of "taxes". Taxes are defined by rules that specify how to adjust a balance, such as how to deduct credits from a player's winning payouts, or from a

player's credit balance under various circumstances. The following is a list of exemplary taxes:

[0161] 1. The gaming device withholds from a player any payout that would bring a player's net winnings for a contract period above a predetermined threshold. For example, suppose a player has begun a contract period at a \$1 gaming device by inserting a \$50 bill and receiving therefore 50 credits.

[0162] The player has been playing for 20 minutes, has been doing reasonably well, and now has a credit balance of 145. The player's net winnings for the contract period thus far are 145 - 50 = 95 credits, assuming the player has neither inserted new credits, nor cashed out any credits since beginning the contract period. Now, suppose that the gaming device has a rule in place whereby it withholds from a player any winnings that would bring a player's net winnings for a contract period over 100 credits. So, if the player with 95 credits in net winnings for the contract period now gets an outcome paying 15 credits, then the player may be paid only 5 of the credits, bringing the player's net winning to 100 credits. The other 10 credits are withheld by the gaming device, since payment of the 10 credits would bring the player's net winnings over 100 credits. Now, suppose that a player makes another \$1 wager and loses on the next outcome. His credit balance decrements by one. His credit balance does not remain at 150, even though 5 credits had previously been withheld.

[0163] 2. The gaming device limits the amount of a player's net winnings for a contract period to a predetermined number. With this tax, a player's balance may reflect net winnings exceeding the predetermined number. However, at the end of the contract period the player will only receive net winnings up to the predetermined number. For example, if the player ends a contract period with a balance reflecting net winnings of \$200, and the gaming device has limited net winnings to \$100 for a contract period, then the player may only receive \$100 of his \$200 in net winnings when he cashes out. If the player is not playing in credit mode, then the

gaming device may simply not pay the player any winnings that would bring his net winnings for a contract period over the predetermined number. However, the player may receive a free spin for every credit that he was not paid.

[0164] 3. The gaming device withholds a predetermined number of credits from any payout exceeding a certain threshold. For example, the gaming device withholds one credit on any payout of more than 4 credits.

[0165] 4. The gaming device pays the player only the highest payout for any consecutive sequence of pulls in which the player has won some credits on each pull in the sequence. For example, suppose the player has made eight consecutive pulls with the following resulting payouts: 0, 10, 4, 0, 2, 5, 3, 0. The player would actually only be paid 10 coins in total for the second and third pulls, and 5 coins for the fifth, sixth, and seventh pulls. This is because the second and third pulls were consecutive pulls of winning outcomes. Therefore the player only gets the highest payout of the consecutive pulls, which is 10. Similarly, the highest payout from amongst the fifth, sixth, and seventh pulls is 5. Now in practice, when the player receives a winning outcome, the gaming device does not know whether the next outcome will also be a winning outcome. So the gaming device cannot know what to pay the player for the current sequence of winning pulls. Therefore, if the current payout is the first winning payout in a sequence, the gaming device may pay the player the full amount of the payout. If, however, the current payout is not the first winning outcome in a sequence, then there are two possibilities. In one possibility, the current payout is the highest payout thus far in the sequence, in which case the gaming device may pay the player the difference between the current payout and the next highest payout already to occur in the sequence. In the second possibility, the current payout is not the highest payout in the sequence, in which case the player may be paid nothing, or may have his wager returned, for a push. Going back to the first possibility, if the current payout is the highest payout in any sequence of winning outcomes, then the player may additionally be paid a single coin for every prior winning outcome present in the sequence, so as to convert such outcomes to pushes instead of losses for the player. In other variations of this tax, the player is paid only the highest  $n$  payouts in any sequence of winning outcomes. In still another variation, the player is paid only for the lowest winning outcome in any consecutive sequence of winning outcomes, or only for the median outcome, or only for the modal outcome.

[0166] 5. The player is paid only for the first winning outcome in any sequence of consecutive winning outcomes. Subsequent winning outcomes in the sequence may be treated as pushes, or may be treated as losses. In other variations, the player is paid only for the second winning outcome in any consecutive sequence of winning outcomes, or only for the  $n$ th winning outcome in any consecutive sequence of  $n$  or more winning outcomes (here  $n$  is a natural

number). In the latter variation, if a consecutive sequence of winning outcomes is less than  $n$ , then a player may be paid only for the last winning outcome, may be paid for every winning outcome, or may not be paid for any of the winning outcomes. In another variation, the player is paid only for the last winning outcome in any consecutive sequence of winning outcomes. In still other variations the player is paid only for the first and second winning outcomes in any sequence of consecutive winning outcomes, or only for the  $m$ th and  $n$ th, outcomes, or only for any other combination of winning outcomes. In still other variations, the player is paid only for the first, last, or  $n$ th outcome in any sequence of outcomes in which no more than  $m$  outcomes are non-winning outcomes. There are many other possible variations to this tax.

[0167] 6. The player is paid only for the best line in multi-line play. For instance, if the player has enabled three paylines on the gaming device, and the outcomes for lines 1, 2, and 3 pay 5, 9, and 0 coins, respectively, then the player only receives 9 coins, not 14 coins. In variations of this tax, the player is paid for the highest two lines, the highest 10% of lines, the median line, or the lowest line.

[0168] 7. The gaming device withholds from the player a fixed percentage of any payout. For example, the gaming device withholds 5% of any payout. In many instances, the withholding of a percentage of a payout will result in the withholding of a fractional amount of a credit. For example, withholding five percent of a 10-coin payout equates to withholding one half of a credit. In some embodiments, the gaming device rounds any fractions of a credit withheld either up or down, depending on its rules of operation. Thus, even though the gaming device withholds 5% of payouts, the gaming device may withhold a full credit on a 10-coin payout after rounding up the half credit to a full credit. In another embodiment, the gaming device does not withhold fractional credit amounts, but rather keeps track of the fractional amounts of credits that would have been withheld from a player had they been whole credit amounts. Then, whenever the stored fractional amounts of credits add up to a full credit, the gaming device may withhold such a credit from the player. For example, on two consecutive pulls, a player wins 6 and then 14 credits. The gaming device pays the player six credits for his first payout, but also tracks the 5%\*6 credits=0.3 credits that it would have withheld from the player. Then, when the player achieves the payout of 14 credits, the gaming device figures the withholding from the 14-credit payout as 5%\*14=0.7 credits, adds the 0.7 credits to the 0.3 credits previously stored, and deducts the resultant full credit from the player's payout of 14, giving the player only 13 credits instead. Whenever the gaming device is tracking fractional amounts of credits to be withheld in the future, the gaming device may display such fractional amounts to the player.

[0169] 8. The player receives only the highest payout in any sequence of two non-overlapping handle pulls. For example, the player only receives the

highest payout from amongst the first and second handle pulls, and only the highest payout from amongst the second and third handle pulls. If the player achieves more than two winning outcomes in any designated group of handle pulls, then the lower of the winning outcomes may be treated as a push, and the player may receive his wager back for that handle pull. In variations of this tax, the player receives the highest  $n$  payouts in any sequence of  $m$  non-overlapping handle pulls. The player might also receive only the lowest payout, the lowest positive payout, the median payout, or the modal payout in any sequence.

[0170] 9. The player receives only the highest payout in any sequence of two handle pulls. Note that sequences of handle pulls considered in this tax may overlap. For example, the sequence consisting of the first and second handle pulls overlaps with the sequence consisting of the second and third handle pulls. Thus if a player has a sequence of handle pulls resulting in payouts of, 0, 3, 8, 2, 0, 3, 5, 0, then the player receives 8 coins and 5 coins, for a total of 13 coins. The player receives nothing for the second or fourth pulls, because the third pull, which is in a sequence of two with both the second and fourth pulls, respectively, is higher than both the second and fourth pulls. Similarly, the player receives nothing for the sixth pull, because the seventh pull is higher.

[0171] 10. The player begins a contract period with a number of credits that is less than the equivalent amount of money he has paid. For example, a player inserts \$50 into a gaming device and then receives 50 credits.

[0172] 11. The player is only allowed a certain number of winning outcomes within a given time frame. For example, the player may only win three times in any 30-second period. If the player wins more than 3 times in a 30-second period, then the third win may be a push. With such a tax in place, a player may be required to maintain a certain rate of play so that he does not pause for the remainder of a 30-second period after having won three times. Time frames may be overlapping or non-overlapping. In the latter case, for example, the player cannot win more than 3 times in any rolling 30-second period. In the former case, there are discrete 30-second periods during which the player cannot win more than three times. However, a player can win more than three times within 30 seconds by winning twice at the end of a first period, and twice at the beginning of a second.

[0173] 12. The player is only allowed the highest outcome during any given time period. For example, the player might get only the highest outcome from any 30-second period. Once again, the periods might be overlapping or non-overlapping. In variations, a player is allowed the highest paying  $n$  outcomes within any given time frame. Alternatively, the player might be allowed the 2<sup>nd</sup> highest paying outcome in any given time frame, the median paying outcome, etc.

[0174] 13. A player is restricted to win no more than twice his prior win. For example, a player might win

3 coins on a first outcome. Three handle pulls later, the player wins 10 coins. However, since the player's earlier win was 3 coins, he may now receive only 6 coins instead of 10, since six coins would be twice his earlier win. Now, on a subsequent handle pull, the player might win up to 12 coins (or in some embodiments, up to 20 coins, even though he was not given the full 10 coins). Suppose, however, that after his win of 3 coins, the player's next win was one coin. Then, on a later win, the player would be restricted to a maximum of two coins.

[0175] 14. One or more coins is taken from a player upon the occurrence of a predefined event or sequence of events. For example, every time the player loses on three consecutive spins, a coin is taken away from him. Alternatively, if a player wins three times in a row, a coin might be taken from him. In another example, if a player wins more than 5 coins on three consecutive spins, a coin is taken from him. In another example, if a player wins more than 20 coins in any two-minute period, then a coin is taken from him.

[0176] 15. A percentage of a player's credit balance is taken upon the occurrence of some random event, such as an outcome. For example, an outcome consisting of three blanks on the three reels of a slot machine might cause a player to lose half of his balance. Any fractional amounts of a player's balance may be rounded up or down.

[0177] 16. A fixed amount of a player's credit balance is taken upon the occurrence of some random event, such as an outcome. The number of credits taken may be 5, 10, etc. In particular, the number of credits taken may be more than the maximum possible wager at the gaming device, or more than the player's last wager.

[0178] 17. When a player's credit balance meets certain criteria, the player is limited as to what outcomes constitute winning outcomes, or as to how much he can win. For example, when a player's credit balance exceeds 200, he may only be restricted to receiving 50% of any payouts. In another embodiment, when the player's credit balance goes below zero, the player may be able to win only the jackpot. In one embodiment, when the player's credit balance first meets one of the designated criteria (e.g. when it goes over 200), the taxes may apply thereafter, even if the player's credit balance later ceases to meet the criteria. For example, if a player's credit balance goes over 200, then all future outcomes, at least for that contract period, may give the player only 50% of what the outcomes would normally pay. In other embodiments, the tax ceases to apply once the player no longer meets the criteria.

[0179] Any of the above taxes may have exceptions to when the tax is applied. In particular, exceptions may occur when the player receives a jackpot outcome. For example, even if a tax prevents a player's balance from exceeding \$150, the player's balance may go above \$150 if he obtains a jackpot-winning outcome. If an outcome would ordinarily be a push (e.g. because the prior outcome was a win and a player is prevented from winning twice in a row), and a

jackpot-winning outcome occurs, then the player would still be allowed to win the jackpot.

[0180] Any of the above taxes may also be limited such that not more than a predetermined amount of money is taken from the player during a contract period or during any particular time period. For example, suppose a player is taxed such that whenever he attains a streak of winning outcomes, he receives only the payout for the first outcome, and the rest of the outcomes in the streak are treated as pushes. So if a player were to lose on a first pull, and then achieve consecutive outcomes paying 12, 8, and 2, then the player would actually receive 14 coins: 12 coins for the first outcome, 1 for the second (to repay the cost of the wager), and 1 for the third. In effect, the player has given up seven coins for the second outcome, and 1 coin for the third outcome, for a total of eight coins given up due to the tax. If, at the end of 20 minutes, the player has given up more than 30 coins due to the tax, then the excess coins may be returned to the player. Alternatively, if the player has paid 30 coins due to the tax, prior to the expiration of the 20-minute period, then the tax may no longer apply until the 20-minute period has expired.

[0181] In some contracts, a player is responsible for placing wagers from his own money even after having paid to enter into the contract. These contracts may constitute insurance contracts, whereby the player pays a fixed amount upfront, and then proceeds to wager as usual. After a given time period, or a given number of handle pulls, the player may receive some money back from the gaming device. The money he receives may be an insurance payout for any losses the player has suffered in excess of a certain threshold. For example, the player initially pays \$20. He then makes 250 handle pulls, inserting wagers for each, and collecting winnings from each. The gaming device determines whether, in the 250 pulls, the player has lost more than \$40. If he has, the gaming device pays the player enough so as to bring the player's total losses down to only \$40. Another variation of an insurance contract pays the player a fixed percentage of losses below a certain threshold. For example, at the end of an insurance period, the player may receive back 50% of any losses sustained in excess of \$50. Therefore, a player who had lost \$100 would receive \$25 back.

[0182] In some embodiments, the player may purchase insurance for a variable time period. The insurance then pays the player such that the player's losses are limited to a fixed amount per unit of time. For example, the player might purchase insurance that limits his losses to \$30 per hour. If the player then plays for 2 hours, the gaming device will reimburse him enough money to limit his losses to \$60. If the player plays for 3 hours, the gaming device will reimburse him enough money to limit his losses to \$90.

[0183] In some embodiments, a player enters into a contract, such as an insurance contract, that requires the player to pay money on a periodic basis, not just upfront. For example, the player must pay an extra coin every three spins in order to remain insured. After the player has made a predetermined number of regular payments, the cost of the insurance may even go down. For example, instead of paying one coin every three pulls, the player may pay two coins every seven pulls. In this way, a player becomes "invested" in his play. If an insured player leaves a gaming device where he has good insurance rates, he risks having to start over at a new gaming device with higher rates.

[0184] The player may pay for contract play, including insured play, in any number of other ways, described in the section on taxes above. For example, the player may agree to have one coin taken away from any payout of 4 coins or more, or may agree that any second consecutive win will count as a push.

[0185] Related to an insurance contract is a contract that rewards a player for a fixed amount of play, regardless of whether the player has sustained losses. For example, whereas an insurance contract might pay a player only if he has sustained losses after 20 minutes of play, a contract of the present embodiment rewards a player simply for completing 20 minutes of play. In this embodiment, the player plays in a normal fashion, using his own money to make wagers, and directly receiving any winnings. However, after a fixed period of time, or after a fixed number of handle pulls, the player may receive a benefit, such as a cash payment, a coupon, voucher, or gift certificate, or a number of free spins.

[0186] Free spins may give the player the opportunity to win standard payouts on the gaming device. Alternatively free spins may be for alternate prizes. For example, a free spin may allow a player to spin for products or services associated with the casino or with some third-party merchant. A special reel or wheel of the gaming device may contain a free meal pass, a free pair of show tickets, a gift certificate at an online bookstore, etc. The reel may use different symbols than those associated with the normal play of the game. Alternatively, a spin for prizes may employ a standard reel, or reels of the slot machine, with different symbols or symbol combinations given alternate meanings. For example, the cherry symbol wins the player a free line pass. The bar symbol wins the player a free pair of show tickets, the diamond symbol wins the player a \$100 gift certificate at the casino's jewelry store.

[0187] Also related to insurance play is a contract where the player pays upfront for a fixed period of play, or a fixed number of handle pulls at which the gaming device assumes a more favorable configuration. For example, payouts associated with one or more outcomes may increase. Winning outcomes may occur with greater frequency. The size of the jackpot may increase. In one embodiment, the player might pay \$10 upfront. Then, for the next half hour, the gaming device may reconfigure itself to pay true odds, or to return an average of 100% of the amount wagered. On average, rather than paying upfront, the player may pay on a periodic basis for an improved machine configuration.

[0188] Typically, a gaming device can sell only one pull to a player. After making a pull, the player can simply leave, and the gaming device is thereby deprived of further business from the player. The gaming device has a better chance of making repeat sales to a player when he inserts, say, a \$20 bill. A player who has just inserted a large bill typically receives a large number of credits on the gaming device. It is then very easy for the player to make a large number of handle pulls, since each handle pull can be purchased electronically using a credit on the meter. Nevertheless, a player with a large credit balance typically still has the opportunity to cash out at any time and to leave the gaming device.

[0189] In one embodiment, a contract allows the gaming device to sell a large block of handle pulls to a player at

once. In return for purchasing in bulk, the casino can give the player a reward. Once the player has paid for a block of spins, the player may be bound to make those spins. In other words, he may not be able to cash out a credit balance corresponding to any spins he has not made. (He may, on the other hand, be able to cash out any winnings that result from making those spins). However, since the player has paid in advance, and committed to a certain number of handle pulls, the gaming device may reward the player with cash, with extra spins, with comps, or with any other benefit. For example, for \$50, a player might receive 52 spins at a \$1 machine. Alternatively, the player may receive 50 spins and a free meal comp.

[0190] One important aspect of allowing the advanced purchase of handle pulls is the way the handle pulls are displayed to the player. If a player pays \$50 and receives 52 handle pulls, then there would be a drawback to simply putting 52 credits on the credit meter. Certainly, the 52 credits would pay for the 52 handle pulls. But the player might think that he has the option to cash out the balance of his credit meter at any time, and may then be disappointed when he is unable to do so. Therefore, in one embodiment, a balance separate from his credit balance is displayed to the player. This new balance is a spin balance. The spin balance shows the number of spins the player is allowed. Players can be taught that a spin balance is only good for spins, and that it cannot be cashed out, whereas a credit balance can be cashed out at any time. Additionally, any winnings paid using spins from the spin balance may be added to the player's credit meter. The player would then be able to receive the winnings immediately, if he so desired.

[0191] A spin balance is also applicable outside the framework of contracts. A player, in the course of regular play, might win several free spins. The player might have the option of using the spins at any time. Such spins can be added to the player's spin balance, so that it is clear they are not credits and cannot be cashed out. FIG. 10 shows a gaming device that has both a credit balance and a spin balance displayed. A player at such a gaming device might cash out the 12 credits in the credit balance at any time. The player might also use up spins by pressing the "Use Spin" button. When the player presses the "Use Spin" button, a spin is deducted from the player's spin balance, but not from his credit balance. In some embodiments, not illustrated, a player may be able to use multiple spins at once. Using multiple spins at once might be equivalent to betting multiple coins at once, and may make the player eligible for a higher pay table, or for the bonus round. In some embodiments, a player might be able to use both spins and credits on a single handle pull. For example, the player uses 2 credits and 1 spin, which would get the player an equivalent pay table as if he had used 3 credits.

[0192] In some embodiments, even after a player has prepaid for a large number of handle pulls, and has received a benefit, the player may still cash out an amount of money corresponding to unused handle pulls. For example, if the player has paid \$50 for 50 handle pulls plus two bonus handle pulls, and has made 30 handle pulls, the player may cash out and receive \$20 back. However, the player may thereby forfeit any benefit he received, i.e. the two bonus handle pulls.

[0193] As described herein, players may have some restrictions on the play covered by the contract. For

example, a contract may cover an hour's play at a gaming device, but require the player to make between 600 and 800 pulls in that hour. In some embodiments, however, contracts may allow players to quit early or to play more than is otherwise covered by the contract. For example, a contract might cover an hour's worth of play. After the first half-hour, the player may be ahead by \$100 and wish to quit without risking the loss of the \$100 in the subsequent half-hour. He may therefore opt to pay \$20 in order to be released from the obligation of continuing the contract. He may then collect his \$100 in winnings.

[0194] A player at a gaming device may reach the end of a contract with accumulated credits just short of an amount necessary to collect winnings. However, the last 17 out of 20 pulls may have been wins for the player. The player may feel as if he has some momentum going for him and therefore may not wish that the contract be finished. In some embodiments, the player may extend the contract. For example, the gaming device might prompt the player, saying, "For only \$5 more, we'll give you another 200 spins added to your contract." If the player accepts, then the casino or insurer has made a new sale with potential profitability. In some embodiments, the player may be allowed to extend a contract for free, or may even be paid to extend the contract. For example, the player may have winnings of \$100 at the end of a contract. The casino, or insurer, may figure that if the player were to keep pulling, he would be likely to lose some of that \$100. So the casino may pay the player \$5 to take another 200 pulls.

[0195] In a related embodiment, a player may carry over the accumulated credits from a first contract to a second contract. Thus, a player with 40 accumulated credits at the end of a first contract may begin a second contract with 40 accumulated credits. The player may pay or be paid for carrying over credits.

[0196] In many embodiments, the player pays a fixed sum to buy the contract. In exchange for that fixed sum, the player can then gamble a significant amount with little or no risk of losses. In many embodiments, the insurer takes the risk of the player's loss. The insurer must therefore price the contract so as to be compensated for the risk it takes. In other embodiments, the casino and the insurer share the profits and losses associated with a contract. To ensure a profit to be divided amongst the two, a contract may be priced in excess of a player's average win. Note that a player's loss would count as zero in figuring out the player's average win, since the player does not have to pay for losses.

[0197] One method of establishing the price of the contract involves first figuring out what the insurer might expect to pay, on average, to cover a player's losses. Another method of pricing a contract involves first figuring out what the casino/insurer combination might expect to pay, on average, to compensate a player for his winnings. Both methods involve similar computations. Therefore, computations will be described below with respect to only one or the other method of pricing a contract.

[0198] 1) The insurer obtains the gaming device or a component of the gaming device containing significant information about the operation of the gaming device (e.g. the CPU). The insurer then operates the gaming device as a player would when under contract. For example, if the insurer is to sell contracts for 600 pulls,



the insurer would make 600 handle pulls at the gaming device and record the number of accumulated credits at the end of the 600 pulls. The insurer may repeat this process of testing contracts at the device for a large number of trials. The insurer may then average what its payments would be over all the trials. Note that while it might take a player days or years to complete, say, 100,000 contracts at a gaming device; the process may be sped up for the insurer by giving the gaming device special instructions to generate outcomes more rapidly. The performance of large number of trials in the manner described above is often called a Monte-Carlo simulation.

[0199] The following is an example of pricing a contract. Using the method of pricing described above, an insurer simulates the execution of a 600-pull contract. The insurer repeats the simulation four more times. After the first simulation, the player has won \$10. After the second, the player has lost \$5. After the third, the player has lost \$17. After the fourth, the player has lost \$8. After the fifth, the player has won \$3. To figure out what the insurer must pay, on average, the insurer adds the three losses to get: \$5+\$17+\$8=\$30. The insurer then divides by five, the number of simulations, to get: \$30/5=\$6. The insurer doesn't care, for the purposes of this calculation, how much the player won when he did win, since the casino is the one paying the player his winnings. Now, in order to obtain an average \$4 profit, the insurer might charge \$10 for each contract.

[0200] 2) The insurer obtains or creates software that mirrors or models the operation of the gaming device. For example, the software is configured to generate the same outcomes as does the gaming device with the same frequency as the gaming device. For each outcome generated, the software tracks what a player's accumulated credits would be. As before, the insurer may simulate many contracts and average what its payments would be over all the trials.

[0201] 3) The insurer mathematically models potential outcomes of one handle pull of the gaming device using a random variable with a probability mass function (PMF) or probability density function (PDF). With these functions, the x-axis may represent potential winnings, such as -\$1 or \$3, which can occur from a single handle pull. The example of -\$1 indicates the player has paid \$1 for the pull but has won nothing. The example of \$3 indicates that the player has paid \$1 for the pull and won \$4. The y-axis of these functions represents the probability or probability density of each outcome occurring. The probability of the player getting -\$1 on a pull might be 0.8, while the probability of the player getting \$3 might be 0.2. A PMF for the number of accumulated credits at the end of a contract can then be created by summing the random variables representing individual handle pulls. If each pull is independent with an identical PMF, as is common with slot machines, then the PMF for the results of the entire contract can be created using repeated convolutions of the PMF's for individual handle pulls. If, for example, 600 pulls are involved, then the PMF for single a handle pull may be convolved with itself 599 times to generate a PMF for the entire contract. Using this resultant PMF, the insurer can easily calculate how much it would expect to pay to cover a player's losses

on each contract. If the resultant random variable is denoted by  $w$ , and the insurer would be required to pay for any player losses, then the insurer's expected payment is given by

$$\sum_{w=-\infty}^{\infty} w \cdot \text{probability}(w).$$

[0202] 4) In the method described above, Fourier Transforms, Z transforms, Laplace Transforms, or other transforms can be used to aid in the calculation of the repeated convolutions. Such a use of transforms is well known in the art.

[0203] 5) As is well known in the art, with many classes of random variables, repeated summation results in a Gaussian probability distribution. This distribution has the shape of the familiar bell curve. The Gaussian distribution has the advantage of being fully described by only two parameters, a mean and a standard deviation. If a Gaussian probability distribution is used to approximate the sum of a large number of independent, identically distributed random variables, such as those that often describe handle pulls, then the mean and standard deviation of the Gaussian distribution is very easily calculated based on the mean and standard deviation of a random variable describing an individual pull. Such calculations are well known in the art. Thus, a Gaussian distribution can easily be generated to approximate the PMF of a player's accumulated credits at the end of a contract. Using this distribution, the insurer can calculate the amount it would be required to pay, on average, to cover a player's losses. The method of calculation is similar to that described in 3). If a Gaussian PDF is used as an approximation, then an integral sign replaces the summation sign, and "probability" is replaced by "probability density."

[0204] The following is an example of using a Gaussian probability density function to approximate the amount a casino would be required to pay, on average to, to compensate a player for his winnings at the end of a contract. The contract may then be priced in excess of this amount to ensure an average profit for the casino/insurer combination. A Gaussian function is given by the formula,  $f(x)=1/\sqrt{2\pi\sigma^2}\exp(-(x-\mu)^2/(2\sigma^2))$ . In this formula,  $\sigma$  is the standard deviation, and  $\mu$  is the mean. Now, let us suppose that a single handle pull of a slot machine results in a required payout to the player described by a probability mass function with mean  $\mu_n$  and standard deviation  $\sigma_n$ . Then, assuming each handle pull is independent,  $n$  handle pulls of the slot machine may be described by a function with mean  $\mu=\mu_n n$  and standard deviation  $\sigma=\sigma_n \sqrt{n}$ . Furthermore, if  $n$  is large, then the function describing a casino's aggregate payout after  $n$  handle pulls may be approximated by the Gaussian function  $f(x)$ , whose formula is given above.

[0205] To calculate what a casino would have to pay to compensate a player for his winnings, on average, we note that the casino pays when the player wins, but receives nothing when a player loses. Therefore, the expected payment of the casino is given by:

$$\int_{-\infty}^{\infty} w f(x) dx = \int_{-\infty}^{\infty} w f(x) dx = \int_{-\infty}^{\infty} w f(x) dx.$$

[0206] We proceed to solve the integral:

$$\begin{aligned} \int_0^{\infty} x + f(x) dx &= \int_0^{\infty} x + 1/\sqrt{(2\pi\sigma^2)} \exp(-(x-\mu)^2/(2\sigma^2)) dx \\ &= 1/\sqrt{(2\pi\sigma^2)} \int_0^{\infty} x + \exp(-(x-\mu)^2/(2\sigma^2)) dx \\ &= 1/\sqrt{(2\pi\sigma^2)} \int_0^{\infty} ((x-\mu) + \exp(-(x-\mu)^2/(2\sigma^2)) + \\ &\quad \mu \exp(-(x-\mu)^2/(2\sigma^2))) dx \\ &= 2\sigma^2/\sqrt{(2\pi\sigma^2)} + (-1/2) + [\exp(-(x-\mu)^2/(2\sigma^2))]_0^{\infty} + \\ &\quad \mu \int_0^{\infty} 1/\sqrt{(2\pi\sigma^2)} \exp(-(x-\mu)^2/(2\sigma^2)) dx \end{aligned}$$

[0207] We deal with the two terms separately:

$$\begin{aligned} 2\sigma^2/\sqrt{(2\pi\sigma^2)} + (-1/2) + [\exp(-(x-\mu)^2/(2\sigma^2))]_0^{\infty} &= -\sigma^2/\sqrt{(2\pi\sigma^2)} + [0 - \\ &\quad \exp(-\mu^2/(2\sigma^2))] \\ &= \sigma^2 \exp(-\mu^2/(2\sigma^2)) / \\ &\quad \sqrt{(2\pi\sigma^2)} \\ &= \sigma^2 \exp(-\mu^2 \mu_0^2 / \\ &\quad (2\sigma_0^2)) / \sqrt{(2\pi\sqrt{n}\sigma_0)} \\ &= \pi^{1/4} \sigma_0^3 \exp(-\mu \mu_0^2 / \\ &\quad (2\sigma_0^2)) / \sqrt{(2\pi)} \end{aligned}$$

and

$$\begin{aligned} \mu \int_0^{\infty} 1/\sqrt{(2\pi\sigma^2)} \exp(-(x-\mu)^2/(2\sigma^2)) dx &= \mu \int_{-\mu/\sigma}^{\infty} 1/ \\ &\quad \sqrt{(2\pi\sigma^2)} \exp(-y^2/2) dy \\ &\quad (\text{where } y = (x-\mu)/\sigma) \\ &= \mu/\sqrt{\sigma} \int_{-\mu/\sigma}^{\infty} 1/ \\ &\quad \sqrt{(2\pi)} \exp(-y^2/2) dy \\ &= \mu/\sqrt{\sigma} \left[ 1 - \int_{-\infty}^{-\mu/\sigma} 1/ \right. \\ &\quad \left. \sqrt{(2\pi)} \exp(-y^2/2) dy \right] \end{aligned}$$

[0208] The integral is the cumulative distribution function for a zero mean, unit standard deviation Gaussian, for which tables exist. We denote it by  $N(-\mu/\sigma)$ . Continuing:

$$\begin{aligned} \mu \int_0^{\infty} 1/\sqrt{(2\pi\sigma^2)} \exp(-(x-\mu)^2/(2\sigma^2)) dx &= \mu\sqrt{\sigma} [1 - N(-\mu/\sigma)] \\ &= \mu \mu_0^{1/4} \sqrt{\sigma_0} [1 - \\ &\quad N(-\mu \mu_0 / \sqrt{n} \sigma_0)] \\ &= \pi^{1/4} \mu_0 \sqrt{\sigma_0} [1 - \\ &\quad N(-\sqrt{n} \mu_0 / \sigma_0)] \end{aligned}$$

[0209] Recombining the two terms we get:

$$\begin{aligned} \int_0^{\infty} x + f(x) dx &= \pi^{1/4} \sigma_0^3 \exp(-\mu \mu_0^2 / (2\sigma_0^2)) / \sqrt{(2\pi)} + \\ &\quad \pi^{1/4} \mu_0 \sqrt{\sigma_0} [1 - N(-\sqrt{n} \mu_0 / \sigma_0)] \end{aligned}$$

[0210] If we were to graph the above as a function of  $n$ , the number of pulls, we would see that initially, as the number of pulls in a contract gets larger, a casino could expect to pay more money to compensate a player for his winnings. However, there would reach a point, beyond which more pulls in a contract would actually decrease the amount a casino could expect to pay to compensate a player for his winnings. This illustrates an important feature of contracts. Having more pulls in a contract is not necessarily an advantage for a player.

[0211] 6) A casino or insurer may start with a first price for a contract, and then evolve the price as more and more of the contracts are purchased and executed. For example, if an insurer loses money on the first few contracts it sells, then it may increase the price of the contract. If the insurer makes large profits on its first few contracts, then it may reduce the price.

[0212] Once the insurer has determined what it can expect to pay, on average, to cover a player's losses, the insurer may price the contract so as to give itself a desired profit margin. For example, if the insurer can expect to pay, on average, \$15 to cover a player's losses, then the insurer might price the contract at \$20 to insure itself a \$5 average profit.

[0213] A contract will often require certain behaviors of the player. As described, these behaviors may include maintaining a certain rate of play, or performing a minimum number of handle pulls. The gaming device on which a contract is executed may take various steps to ensure that the behaviors are performed. To this end, the gaming device may initiate handle pulls automatically or may fail to register handle pulls that the player attempts to initiate. For example, if the player must make at least one handle pull every 10 seconds, and the player has failed to make any handle pulls in 9 seconds, then the gaming device may automatically initiate a handle pull for the player on the tenth second. As another example, a player may be restricted from making more than one pull every 10 seconds. If in the same 10-second interval, the player attempts to make more than one handle pull, the second handle pull may not be initiated, at least until the next 10-second interval.

[0214] As can be seen from the above two examples, the player may maintain some control over his gambling behavior even while the gaming device forces him to comply with the contract. So a player who must make a pull every 10 seconds still has control over whether the pull occurs on the first second of an interval or the eighth second of an interval. Such control can be psychologically important, because many players feel that the exact moment at which they initiate a handle pull has an important effect on the ultimate outcome.

[0215] In many cases, a player may not desire to make any active decisions once a contract has been initiated and may simply put a gaming device into "automatic play." The

player may later have the option of taking the gaming device out of automatic play and of manually initiating handle pulls. One further advantage of automatic play is that the gaming device in automatic play mode may generate outcomes very rapidly. Since most modern gaming devices generate outcomes using a computer processor, and since computer processors may execute billions or more instructions per second, a gaming device could easily generate any number of outcomes a player might desire in as short of a time period as desired. For example, a player may have a lunch date in 10 minutes, but may wish to make 1000 handle pulls before then. The player may thereby enter into a contract with the gaming device in which the player will pay, say, \$30, the gaming device will rapidly generate 1000 outcomes (at \$1 per outcome), and the player will receive any positive amount of remaining credits. In fact, such a contract would likely be profitable for the gaming device, since a gaming device starting at \$30, with a house advantage, is unlikely to have a positive credit balance after 1000 pulls.

[0216] Another aspect of automatic play would allow the events of a television show, movie, sports broadcast, etc., to automatically initiate handle pulls on behalf of the player. For example, a player might insert 100 credits into the gaming device, and agree to allow the gaming device to automatically deduct a credit, and initiate a handle pull anytime the word "love" is said in a 30-minute soap opera. Meanwhile, the player may enjoy the show.

[0217] A contract may be offered to a player in a number of ways. A gaming device may use text or synthesized voice to ask a person whether or not he would like to sign up for a contract. A casino attendant may offer a contract to a player, or signs at a casino may point a player towards a casino desk where he may then purchase a contract.

[0218] A number of circumstances may trigger the casino or an insurer to offer a contract to the player. For example, the player may have lost most of an initial stake deposited into a gaming device. A player may be slowing his play, or may no longer be inserting coins into the machine. The time of day may be a player's typical lunch time or departure time. A player may have the opportunity to enter into a contract only if he also agrees to do business with a particular merchant or group of merchants. A player may have the opportunity to enter into a contract if the casino or insurer deems him a good, valuable, or loyal customer.

[0219] A player may specify a desired contract in a number of ways. At a gaming device, a player may use a touch screen to indicate his desire to enter into a specific contract. Using the touch screen, the player may select from a menu of possible contracts. For example, the menu might list several contracts with different time durations or different prices. The player could then select a contract by touching an area of the screen next to his desired contract.

[0220] The player might use menus to customize a contract for himself. The player might use a first menu to select a duration of the contract (e.g. 600 pulls, or ½ hour). A second menu might be used to select a rate of play. A third menu might be used for coin denomination. Many other menus are possible for other contract features. Once the player has selected several contract features, the gaming device may select the remaining feature so as to make the contract profitable for the insurer. For example, once the

player has chosen a number of pulls and a coin denomination, the gaming device might choose the price of the contract.

[0221] Rather than a touch screen, a player may use special buttons, keys, or voice input to specify a desired contract or contract terms.

[0222] In some embodiments, a player chooses a contract prior to approaching the gaming device or even the casino. A player might select a contract on the Internet. On the Internet, the player might specify terms of the contract, such as the number of pulls, the rate of play, the cost, the payout tables, the winning symbol combinations, etc. The player may then print out a code or a document describing the terms of the contract. The player then brings the code or document to a gaming device that then recognizes what contract the player has chosen. When the player signs up for a contract, a description of the contract might be sent electronically directly to the gaming device. The player might then only identify himself at the gaming device in order to initiate contract play.

[0223] Other terms of a contract a player may agree to or specify include: the font size of the machine, the noise level of the machine's sound effects, the particular game (e.g. number of reels, number of pay lines), the brightness of the display, etc.

[0224] To confirm entry into a contract, a player might sign a document that may contain the terms of the contract. The document may be printed from a gaming device or from the Internet, or may be obtained from a counter at a casino. The signed document may then be deposited into an opening in the gaming device, may be returned to a casino counter, or may be kept by the player. The player might also sign an area on a touch screen or other sensing device.

[0225] A player might also confirm entry into a contract simply by paying for it. The player might pay by depositing tokens, coins or other currency into the gaming device. The player might pay using a credit or debit card. The player might also pay from a player credit account established with the casino. The player might pay at a counter of the casino and might receive a contract or a contract indicator to bring to a gaming device. The gaming device might then recognize the contract indicator by, for example, a bar code, and then execute the contract.

[0226] A typical contract may cover and/or require a large number of handle pulls by the player. Now ordinarily, when a player is gambling at a gaming device for a long period of time, the player makes a number of decisions related to his gambling. Should the player play more quickly or more slowly? Should the player double his bet after a loss? Should the player quit after a sizable win? Should the player take a short break to use the restroom?

[0227] Since the contract covers a large number of pulls, it is possible for some player decisions to be made before hand and included in the contract. A gaming device may then act on the decisions specified in the contract without further input from the player. For example, while negotiating a contract for an hour of play at 10 pulls per minute, a player might decide he'd like a 15 minute break between the first ½ hour and the second ½ hour of pulls. The gaming device might then execute the contract for the first half hour by automatically spinning and generating outcomes for the first

½ hour. The gaming device might then freeze for 15 minutes, preventing other players from stepping in and allowing the contract holding player to take his 15 minute break. The device can then unlock after 15 minutes, perhaps with the entry of a password, and resume the generation of outcomes.

[0228] One important aspect of having a player's decisions spelled out before hand in the contract is that the player need not even be present at the gaming device. A player can sign up for a contract at a casino in Las Vegas, and then have the contract executed automatically by a gaming device. The player can then view a running tally of his accumulated credits over the Internet while in Virginia, for example.

[0229] In general, player instructions built into a contract will include some action to be performed as well as some triggering condition for the action. As an example, a player instruction may be to increase the rate of handle pulls provided accumulated player credits exceed 100. In this example, the action is to increase the rate of handle pulls, and the triggering condition is whether accumulated player credits exceed 100.

[0230] The following player actions may be part of a player's instructions:

- [0231] 1. Increase or decrease a wager amount on one or more handle pulls
- [0232] 2. Increase or decrease a rate of wagering
- [0233] 3. Cease gambling
- [0234] 4. Change the way outcomes are displayed

[0235] The following conditions may trigger the above actions:

- [0236] 1. The player has just won or lost on one or more handle pulls
- [0237] 2. The player has just won a certain amount on one or more handle pulls
- [0238] 3. Any player defined sequence of wins and losses has occurred on prior handle pulls
- [0239] 4. The player has approached or left the vicinity of the gaming device
- [0240] 5. It has reached a particular time of day

[0241] Player instructions may tell the slot machine to play faster when the player is present or is observing in some way, and to play more slowly while the player is asleep. For example, the rate of pulls may be twice as fast during the day as at night. The rate of play may likewise be faster when an infrared detector in the slot machine senses the beat of the player's presence.

[0242] Player instructions may also tell a gaming device how to play certain games involving player decisions. For example, a player may leave instructions to use basic strategy in a game of video blackjack, or to play according to published theory in a game of video poker. The player may add instructions to always hit a draw to a straight flush.

[0243] A contract may be executed over a range of different time periods. The outcomes, the accumulated player credits, and the player winnings may or may not be displayed to the player at the same time at which the outcomes are being generated.

[0244] In one embodiment, all the outcomes needed for a contract are generated very rapidly by a gaming device, perhaps all in less than a second. The outcomes may then be displayed to the player over a much longer time frame so as to give the player a more exciting gaming experience.

[0245] In another embodiment, outcomes may be continuously generated at a rate comparable to that with which a player might make handle pulls on his own. This embodiment might be entertaining for a player if the player is sitting at the gaming device or watching the outcomes being generated from a home computer.

[0246] In another embodiment, outcomes are generated on a periodic basis at fixed times every day, week, hour, etc. For example, outcomes for a 600-pull contract may be generated 100 outcomes at a time, each block being generated from 8pm-9pm on Sunday. Thus, it would take just under six weeks for the entire contract to be executed. This method of execution may be ideal if a player has a schedule as to when he enjoys watching outcomes being generated. For example, the player might enjoy seeing outcomes generated while he watches his favorite show on Sundays from 8pm to 9pm. This method of execution might also be ideal for the casino if slow business periods occur on a periodic basis where the entire contract cannot be executed in a single period.

[0247] In still another embodiment, outcomes are generated on a flexible basis, either when it is convenient for the casino or for the player. In this embodiment, the casino may wait for a gaming device to be free of use before using it to generate the next couple of outcomes of a contract. Alternatively, the player may signal the gaming device any time he is ready to have the next few outcomes generated.

[0248] In many contract embodiments, there is a limiting element of time or handle pulls. As such, it is useful for the gaming to display to the player a measure of the amount of time remaining in a contract, or a measure of the number of pulls remaining. As an example, a contract may allow a player to insert \$20 into a gaming device, play for three minutes without paying for any handle pulls, and to keep any money won during the three minutes of play. During the time period covered by the contract, the gaming device may display a clock to the player that counts down the time starting at three minutes. So the clock would begin at "3:00", then read "2:59", etc. Of course, the clock could also begin at zero and count up to 3:00. The clock could display time to any desired precision, including hours, minutes, seconds, tenths of a second, hundredths of a second, etc. For longer contracts, the clock could display days, weeks, months, years, etc. The clock could be analog or digital. The clock could be built into the gaming device as a dedicated LCD display or even as an actual clock with gears or pendulums. Alternatively, the clock could be displayed on the display screen of the gaming device.

[0249] With a clock ticking off the seconds, a player would always be aware of how much time he had to finish a contract. In contracts where making a large number of handle pulls benefits the player, the player might find it very exciting trying to complete as many handle pulls as possible before time runs out. The clock would also reduce the potential for disputes by players who believed they were not given enough time to complete the play of a contract.

[0250] In many embodiments, once the clock has reached zero, the player's time for completing the contract has

finished, and no more of the player's handle pulls count towards the contract. The player may be given one additional handle pull even after the clock has hit zero, so as to eliminate any dispute from the player as to whether he actually made the last handle pull in time to be counted.

[0251] Just as a clock may track the elapsed time for a contract, a counter may track the number of handle pulls made in a contract, or the number of handle pulls yet to be made in the contract. For example, if a contract allows a player to make 500 handle pulls, then a counter may begin at zero and increment by one every time the player completes a handle pull. When the counter reaches 500, the player is finished. Alternatively, the counter may begin at 500 and count down to zero.

[0252] In some embodiments, during the course of a contract, a player may win extra time, or may win the opportunity to make additional handle pulls. For example, one symbol on the reels of a slot machine may be a clock symbol. If the player obtains the clock symbol, the player may be given an extra minute in which to complete the pulls of his contract. In another example, the player may obtain a symbol that gets him a certain number of extra spins for his contract. Note that extra spins do not necessarily constitute free spins, because the extra spins may only occur within the framework of a contract. Thus, if a player has a large negative credit balance in a contract where he keeps any positive credit balance, a few extra spins might do him little good, since the player is unlikely to get out of negative territory. In some embodiments, a player may win extra spins even though his contract is for a set period of time. In this case, after the expiration of the time period covered by his contract, the player may get to make the number of extra spins that he had won during the period. Additionally, a player whose contract specifies a number of spins allowed, may win extra time. In this case, once a player has completed his spins, he may be allowed the extra period of time in which to make as many spins as he can.

[0253] In some embodiments, the gaming device provides an alert to the player when the time remaining has reached certain levels. For example, a player's contract might provide insurance to a player, with the insurance covering any losses sustained by the player during a ten-minute period. When the player has only one minute left in the contract period, the gaming device may provide an alert to the player such as, "One minute to go! Get in all the pulls you can!" Providing an alert to a player may add a sense of excitement, as the player may try to make handle pulls more rapidly, much as a runner might pick up his pace as he approaches the finish line of a race. Additionally, providing an alert to a player can reduce the likelihood that a player will be caught by surprise when a contract period ends. A player might be upset were he to assume that a contract was still in effect even after the period covered by the contract had elapsed. For example, the player might be upset if he believed his losses to be insured, when in fact they no longer were. Just as a gaming device may alert the player as to the amount of time remaining in a contract period, so too might the gaming device alert the player as to the number of pulls remaining.

[0254] The gaming device may also provide the player with periodic updates of his status in relation to the contract. Exemplary status information may include:

[0255] 1. The player's credit balance.

[0256] 2. The number of additional credits the player needs to win in order to receive a payment. For example, at the end of a contract, the player may get to keep any number of credits exceeding a threshold of 100 credits. If the player currently has a credit balance of 90 credits, then the gaming device may print a message such as "Win only 10 more credits and you're in the money!"

[0257] 3. The number of credits the player is guaranteed so far. For example, a contract may guarantee a player a number of credits equal to half of the highest credit balance the player achieved during the contract. Thus, if the player has already achieved a balance of 100 credits at some point during the contract period, then the gaming device may tell the player "You are guaranteed 50 credits. Keep on playing!" In another example, a contract guarantees that a player will always receive a certain minimum payment at the end of the contract period. For example, the player begins with a balance of \$50, but will always receive at least \$40 at the end of a contract period. In this case, the gaming device may print a message for the player such as, "Five minutes to go. Minimum payment: \$40."

[0258] 4. The number of credits a player would receive if the contract were to end right then. For example, if a contract allowed a player to receive any credits in excess of 40, and his current credit balance was 60, then the gaming device might display a message such as, "You are 20 credits ahead."

[0259] Note that status information may be displayed separately or in conjunction with information concerning the number of pulls remaining, or the amount of time remaining in the contract period.

[0260] Once the contract period has ended, the gaming device may also print status information for the player, including such information as his ending balance, and the amount of credits that are due to the player. In one embodiment, the player is prevented from spinning once his contract period has ended, but before he has received payment. In this way, the player is less likely to confuse handle pulls he has made that are covered by the contract, with handle pulls that are not covered by the contract. For instance, once the time period of a contract has ended, the gaming device may display the message,

[0261] "Time is up. You have lost a total of \$20 in the last 100 handle pulls. Your insurance covers half of your losses. You are due \$10. Please press the 'Get Money' button on your screen to receive your payment."

[0262] Once the player presses the "Get Money" button, his gaming device may pay him \$10. Once the gaming device has paid the \$10 to the player, the player may begin spinning again, but this time outside of the framework of the contract.

[0263] One obstacle with contracts involving timed play is that the gaming device may malfunction in some way. For example, the reels of a mechanical-reel slot machine might jam. Or a player might cash out coins to tip a waitress, only to find that the coin bopper of the machine is empty, and the

hopper will have to be filled by an attendant. During the time of the hopper fill, the player cannot spin. Therefore, in one embodiment, a player is given extra time during a contract that is timed, and where the gaming device malfunctions. The player may have the opportunity to actually decline the extra time. In some contracts, making additional handle pulls is a disadvantage to the player, and so it would benefit the player to lose the time. In another embodiment, the player may move to another machine and complete his contract there. To move to another machine, the player might receive a code from his first gaming device. The code might indicate, for instance, the terms of the contract, the amount of time the player has remaining, the player's balance, etc. The player might then type the code into a new gaming device. The new gaming device would then interpret the code according to standardized rules, and configure itself so as to allow the player to resume contract play at the same point from which he left off.

[0264] Many contracts require that a player play for the full period of time specified in a contract. For example, a player might have to play for a full hour in order to receive any winnings associated with a contract. If the player stops play before the contract period has fully elapsed, the gaming device may assume that the player has abandoned the contract. For example, once the gaming device has detected a pause in play of a predetermined length, the gaming device may reconfigure itself for regular play. The reconfiguration may entail zeroing out any credit balance associated with a contract, eliminating or blanking out any timer or counter associated with the contract, and turning off any indicators that a contract is in progress. Thereafter, the player who has entered into the contract may not have the opportunity to resume play in the contract. Alternatively, upon sufficient proof that a player had previously entered into a contract, the player may resume the play of a contract. For example, a player may present his tracking card to a gaming device at the time when he enters into a contract. The gaming device may then associate the player tracking card with the contract. If the player later leaves the gaming device, the gaming device may store a record of the state of the contract, including the number of remaining pulls, credit balance, etc. The player might later insert his tracking card into the same gaming device, or into another gaming device linked to the first, e.g., via a network. The gaming device may associate the player tracking card number with the unfinished contract, and reconfigure itself to contract play mode, allowing the player to complete his previously unfinished contract. The player may use many other means of proving his identity so as to resume contract play, such means including a password, an answer to a question, biometric data, etc.

[0265] In other embodiments, a player may be allowed to pause the progress of a contract so that he may take a break. For example, in the midst of a contract, a player may press a "freeze" button on his gaming device. The player may withdraw his tracking card, and walk to the restroom. In the meantime, for a designated period of time, no other player may be allowed to touch the first player's gaming device. The player may later return, reinsert his tracking card, and thereby unfreeze the gaming device so as to continue contract play. The time when the player was away may not have been counted towards the period of contract play. For example, if a contract period is to last an hour, and the player takes a five-minute break during the contract, then the player may finish contract play one hour and five minutes after

beginning. If a player has left a gaming device, having pressed "freeze", and does not return to the gaming device within a designated period of time, then the gaming device may assume that the player will not return, and may reconfigure itself for regular play.

[0266] A player may be limited to a predetermined number of breaks during contract play, or to breaks of up to a maximum time duration. In some embodiments, if a player does not play for a predetermined period of time, the gaming device may initiate handle pulls automatically on behalf of the player.

[0267] As described herein, a player may enjoy watching from a remote location as the outcomes of his contracts are generated. Since the player is not physically at the slot machine, the outcomes must be presented to the player via some graphical representation. In one embodiment, a camera simply films the gaming device generating the player's outcomes. The image from the camera is transmitted to the player device (FIG. 5) via the Internet, the cable system, satellite, etc. The player device might be, for example, a TV or a personal computer. In another embodiment, the generated outcomes are recorded either by the gaming device, by a camera watching the device, or by a casino employee. The generation of the outcomes is then graphically recreated for the player in a manner not necessarily consistent with the physical appearance of the gaming device that generated the outcomes. For example, a gaming device generates the outcome: cherry-orange-lemon. The gaming device then transmits, via the casino server and the Internet, a bit sequence indicating the outcomes cherry-orange-lemon. Perhaps the bits "0000" represent cherry, "0011" represent orange, and "1111" represent lemon. The bit sequence is transmitted to a player's home computer, where a software program displays a cartoon representation of a slot machine. The cartoon shows the reels spinning and stopping with the outcome: cherry-orange-lemon. The cartoon representation of the slot machine may not look anything like the slot machine that originally generated the outcomes. In some embodiments, a player views a combination of the actual image of his gaming device, and a computer-rendered version of a gaming device. For example, a cartoon of the reels spinning might be displayed within the frame of an actual image of the slot machine, minus the reels.

[0268] In some embodiments, the player does not view a graphical representation of the outcomes, but sees the outcomes as text, such as "seven-bar-bar," "s-b-b," "7-7-b-b," etc. The player may not even see the outcomes, just how much he has won or lost on every pull. Thus, the player may view a periodically updated tally of his accumulated credits. He may only view his total accumulated credits, or his take home winnings, after all outcomes have been generated.

[0269] Any graphical or textual representation of the player's outcomes, accumulated credits, or other contract information may be displayed either on an entire portion of a computer or TV screen, or on a smaller portion of the screen. For example, a small cartoon slot machine may reside in a box in the upper right hand corner of a TV screen that simultaneously displays a regular TV show. A player watching television need then only glance up at the corner of his screen to follow the progress of his contract. Representation of outcomes may also be placed in an email message to the player.

[0270] Of course, the various representations of outcomes may be used just as well with a player physically present at the gaming device or at the casino.

[0271] In some embodiments, the player calls up a number to monitor the progress of his contract. He may enter a code or password when prompted by a voice response unit (VRU) and thereby access the outcomes from his particular contract.

[0272] A player may be sent updates on his contract only when certain triggering conditions are met. For example, a player may only wish for updates when he wins more than 100 credits on a spin, or when the contract terminates.

[0273] In one embodiment, a gaming device on which contract play is in progress provides an explicit display that contract play is in progress. The display may serve to remind a player that certain activities that would otherwise be allowed are not now allowed. For example, in contract play, the player may not be able to cash out his credit balance. The player may not be allowed to wait more than 10 seconds between spins. Many different restrictions on a player may apply, depending on the nature of the contract. On the other hand, during contract play, certain rules or activities may apply that otherwise would not. For example, during contract play, a player might obtain outcomes that would cause him to lose numerous credits from his credit balance at once.

[0274] Furthermore, an obvious notice that contract play is in progress allows a player to act in his own benefit. For example, if the player has purchased an insurance contract for 200 pulls, then the player may beneficially make handle pulls during the insurance period, as he would not be responsible for all of his losses. On the other hand, were the insurance contract not in place, or were it to have expired, the player might instead wish to walk away from the gaming device.

[0275] FIG. 9 illustrates a gaming device on which contract play is in progress. A large text display on top of the gaming device is lit up, saying, "Contract Play in Progress."

[0276] As described herein, the pricing of a contract will often take into account the expected amount an insurer must pay to a casino to cover a player's losses, or the expected amount that a casino and insurer in combination can expect to pay to compensate the player for his winnings. Pricing of contracts may account for additional factors including:

- [0277] 1. Times or dates on which the contract will be executed
- [0278] 2. The gaming device on which the contract will be executed
- [0279] 3. Flexibility in the contract's execution
- [0280] 4. A player's gambling history
- [0281] 5. The importance of the player as a customer of the casino

[0282] For example, a contract which is to be executed during a period of low customer activity at a casino may be priced at a discount. This is because a casino would like to encourage the use of gaming devices that are otherwise empty. Alternatively, a casino may want to discourage the purchase of contracts during times of high customer traffic, and so contracts may be higher priced at such times.

[0283] If a contract has flexibility as to when it may be executed, then this allows the casino to execute contracts only during times when gaming devices would not otherwise be in use. Therefore, such a contract might be priced more favorably.

[0284] A contract that is executed at an unpopular gaming device, for example, might be priced more favorably for the player so as to encourage the use of that device.

[0285] If a player shows signs of nearing the end of his gambling session, a contract might be priced at a discount for that player. For example, a player might be slowing his rate of play, indicating boredom. A player might be lowering his wager size, indicating a decreasing bankroll. A player might simply have been at a gaming device for such a long time that he would almost necessarily be hungry enough to leave at any moment. Providing a discount on a contract to such players would encourage them to remain gambling for at least the time it takes to execute the contract.

[0286] As discussed, a contract may often involve an upfront payment by the player, in return for which the player may play for an extended period of time, or receive other benefits. However, a player may, for various reasons, wish to discontinue play before having completed the amount of play specified in the contract. For example, if the player has paid \$30 for a contract to receive the net winnings of a gaming device after 500 pulls, the player may wish to quit after 250 pulls in order to go have dinner. The player may be given the option of discontinuing play while still receiving a benefit. The benefit a player receives may be related to his current credit balance, to the number of handle pulls made thus far in the contract, to the amount of time played thus far, or to the amount of money he paid upfront for the contract. In one embodiment, the player may receive his expected winnings for the contract as calculated from the point in time at which the player quits. For example, a player's expected winnings from a contract in which he will receive the net winnings from a gaming device may be \$20 when he has a credit balance of \$35, but 250 handle pulls remaining in the contract. In another embodiment, the player may receive less than his expected winnings, so as to penalize the player for quitting early. Sometimes he may receive more than his expected winnings, as the gaming device will benefit from being open for business with new players.

[0287] Upon surrender, a player might also receive a fraction of his upfront payment. A player might receive half of his current credit balance. In one embodiment, a player with a negative credit balance may actually receive, say, \$5 for ceasing play. Perhaps the contract says that the player gets to keep any net winnings, but is not responsible for net losses. Thus, a player with a negative balance, especially if the credit balance is only slightly negative, might still have high expected winnings. However, a player might perceive \$5 as fairly valuable in relation to his current credit balance, and so may surrender in return for the \$5. Thus, in one embodiment, a gaming device encourages players to surrender by offering them cash or other benefits to surrender.

[0288] In many embodiments, the casino acts as the intermediary in transactions between a player and the insurer. The casino is an intermediary, for example, when its gaming devices collect a player's payment for a contract, even though that payment is meant to go to the insurer. The casino is also an intermediary when it does not collect losses from a player, but from an insurer.

[0289] Since the casino may engage in many transactions with the insurer, it would potentially be inefficient for the casino to transfer money to the insurer, or vice versa, after every transaction. Therefore, the casino or the insurer may maintain records (FIG. 8) of how much one owes the other. The casino and the insurer may then settle their accounts periodically. If the casino owes the insurer money, then the casino may wire money to the insurer. If the insurer owes the casino, then the insurer may wire money. Of course, many other methods of settlement are possible.

[0290] In cases where a contract has resulted in a net win for the player, the player must be paid. If the player is at the casino, he may enter into a gaming device a password or other identifier of himself or of his contract. The gaming device may then access a database in the casino server containing the details of the contract, including the amount owed to the player (FIG. 8). The gaming device may then pay the amount owed in the form of cash, tokens, paper receipts or vouchers, digital cash, digital receipts, etc. The player may also collect his winnings at a casino desk, perhaps after presending identification.

[0291] If a player is remote from a casino when his contract has finished executing, then the player may be sent his winnings either by the insurer or the casino. If the insurer provides the winnings, then the casino may later reimburse the insurer in the amount of the winnings. The winnings may be sent in the form of cash, check, money order, etc. The winnings may be sent by postal mail, by wire transfer, by direct deposit, by email as digital cash, etc.

[0292] In some embodiments, the casino may simply keep the player's winnings in a player account at a casino, to be accessed by the player next time he visits the casino. The winnings may, in the mean time, accumulate interest. The casino (or insurer) may also alert the player that his contract has finished executing and that he has winnings. The player may be instructed to come to the casino and pick them up.

[0293] In some embodiments, the player may have left instructions to take any winnings from a first contract and purchase a second contract. This allows for the notion of a meta-contract. Just as a contract may specify how to allocate money for pulls, a meta-contract would describe how to allocate money for contracts. There could then be meta-meta-contracts, and so on.

[0294] In one embodiment, a player may be halfway through a contract and have negative 200 accumulated credits. The player might therefore lose all hope of winning enough to overcome the 200-credit deficit, and so lose interest in the contract. Therefore, in one embodiment, a player who is well below a threshold number of accumulated credits for winning may play for an altered pay table. Low paying outcomes may be eliminated, while the likelihood of achieving high paying outcomes may increase. This is because a player with a 200-credit deficit probably doesn't care about a win of ten credits, but does care about a win of 500 credits. The overall hold percentage of the machine may remain constant. In some embodiments, the alteration of the pay tables is an automatic function of the number of pulls remaining and the credit deficit of the player. In other embodiments, the player must request an alteration of the pay tables. As an example, a player may select an option that says, "Let me play just for the jackpot. Eliminate everything else and make the jackpot more likely." The player may or

may not have to pay for an alteration of the pay tables. In a more general sense, the pay tables may change such that the standard deviation of the payout for a particular handle pull changes even as hold percentage may remain constant.

[0295] A player might purchase a contract at a casino desk and receive a token that indicates the type of contract. The player might then deposit the token into a gaming device. The gaming device would then recognize the token and be able to execute the contract.

[0296] A player may have the privilege of entering into favorable contracts after a fixed amount of initial betting. For example, if the player wagers for an hour, he may be able to enter into a contract where each pull is at true odds. That is each pull pays back, on average, the same amount that was put in. Typically the pull pays back less.

[0297] A player may receive better odds on contract play when he is recommended to the casino by a friend.

[0298] Certain results of a pull may terminate a contract early. For example, if a player hits the jackpot, the contract may terminate.

[0299] A player's accumulated credits can be displayed to a player as a function of time in the form of a graph. The graph may look much like graphs used to plot the price of a stock market index as a function of time. In some embodiments, a player wins money or some other prize if the graph takes on a certain shape. For example, if the line of the graph is such that it slips between several sets of markers (much like a slider on a slalom course), then the player may win a large prize.

[0300] In some embodiments, a player's winnings on each pull of the contract are reinvested into the contract, whereas in other embodiments they are not. In one example, a player purchases a contract for \$100. The player instructs the gaming device to gamble the \$100 until it is all gone. However, any winnings are not to be used to gamble, they are to be sent directly to the player. In a second example, the player purchases a contract for \$100 and instructs the gaming device to gamble the \$100 until it is gone or until it has become \$200. Here, the player elects to reinvest winnings, using the winnings to pay for new handle pulls even after \$100 worth of handle pulls has been made already.

[0301] A contract may reward a player based on any second order data, or meta-data about one or more outcomes. Examples include rewarding the player if three like outcomes occur in a row, if 20 cherries come up in 10 sequential spins, if the player accumulated credits ever reach 100, etc. An example previously described is rewarding a player based on the pattern of a graph of accumulated winnings as a function of time. A player might choose the "meta-outcomes" on which he desires to be rewarded, and the gaming device may figure the corresponding odds and the size of the reward should the meta-outcome occur.

[0302] A player may be rewarded with the downside a sequence of outcomes much as buying insurance gives him the upside. For example, a player pays a fixed sum of money, and collects winnings for every dollar in the negative the contract ends up. Thus, if a contract ends with the player having minus 20 accumulated credits, then the player collects 20 credits.



[0303] A contract may apply to a "best 100" sequence of a larger sequence of pulls. For example, the player pays \$100 for a contract of 1000 pulls. From those 1000 pulls, the player gets to choose any 100 consecutive outcomes to determine his winnings, and can disregard the rest of the outcomes. So the player can say he wants to use outcomes 506 through 605. Perhaps there was a hot streak during that sequence. The player's winnings are then determined solely based on what happened between pulls 506 and 605. This might result in winnings of \$200, whereas having counted all 1000 pulls would have resulted in a net loss for the player. Of course, the gaming device may automatically choose the most favorable sequence for the player.

[0304] A player may choose his favorite outcome and receive higher payouts for that outcome, special privileges for receiving that outcome (e.g. the ability to terminate a contract), etc.

[0305] In some types of contracts, the pay table for the gaming device changes based on the player's credit balance. For example, the pay table may change to provide a lower payback percentage once a player's credit balance exceeds a certain threshold. The pay table may or may not revert if the player's balance then goes below the threshold. In one embodiment, completely different pay tables are used depending on whether the player's credit balance is above or below a certain level.

[0306] A contract could provide extra bonuses to the player if the player gets his credit balance to a certain level. For example, a player might begin with a credit balance of \$0. If he can get his credit balance to 100, he may receive \$500 at the end of the contract, or he might receive 500 credits in the context of the contract. A player might also receive a bonus for getting his credit balance to zero from \$50.

[0307] An exemplary process according to one embodiment is described immediately below. This description is provided solely as an example of one embodiment. A player with a group of her friends planned to spend four hours at a casino before leaving. However, the player began playing a slot machine with a losing streak, and after two hours, she was down to her last \$20. Meanwhile, her friends were doing fairly well, so it seemed that the player would have to spend her next two hours in the casino doing nothing but waiting for her friends.

[0308] Instead, the player decided to purchase a gaming contract in order to guarantee that her \$20 would last for the next two hours. The player sat down at a dollar slot machine. The slot machine had a touch screen displaying an initial menu. One of the menu choices was "contract play." She pressed that choice and received a second menu that presented several contract options. One option was "1½ hours of play for \$20 at 6 pulls per minute." The player chose that option because it would fill most of the rest of her time at the casino for \$20, all she could afford. The screen on the slot machine then directed her to insert \$20 into the slot machine in order to begin play, and the player did so.

[0309] The slot machine then presented the player with a final screen displaying the main terms of the contract. According to the terms, the player would begin with a balance of zero credits. The player's balance would go down by one credit anytime she initiated a handle pull of the slot machine.

In fact, the player would be able to keep playing even if her credit balance were negative. Her credit balance would also increase on any handle pull where she achieved a winning outcome. At the end of her gaming session, the player would keep the amount of any positive credit balance. However, if her credit balance ended up negative, she would win nothing, though she would also not be responsible for repaying any portion of the negative balance. Another term was that the player was not allowed to make less than six pulls per minute during the execution of the gaming session of the contract. If the player tried to pull too slowly, then the slot machine would initiate pulls for her automatically.

[0310] The player agreed to proceed and was soon busy gambling. She watched as her credit balance rose and fell. Near the end of her contract number of pulls, the player's credit balance stood at minus 10. But immediately after that, on the next pull, she won a payout of 30 credits, putting her balance at 20 credits (positive). In the end, after 1½ hours of play, the player ended up with 17 credits. She received \$17. Although she had lost \$3 (\$20-\$17), she had been able to play for 1½ hours, and had a good time doing so. When she had finished with the contract, her friends were also finishing up and getting ready to depart.

[0311] Although the present invention has been described with respect to a preferred embodiment thereof, those skilled in the art will note that various substitutions may be made to those embodiments described herein without departing from the spirit and scope of the present invention.

What is claimed is:

1. A method comprising:

receiving a payment from a player for a predetermined number of outcomes at a player device;

generating at least the predetermined number of outcomes;

adjusting a balance of the player device based on the outcomes; and

allowing play regardless of whether the balance is less than zero.

2. The method of claim 1, further comprising:

determining whether the balance exceeds a predetermined threshold; and

paying an amount by which the balance exceeds the threshold.

3. The method of claim 1, in which the step of generating at least the predetermined number of outcomes comprises:

generating at least the predetermined number of outcomes over a predetermined period of time.

4. The method of claim 1, further comprising:

preventing withdrawal of funds from the player device until after at least the predetermined number of outcomes are generated.

5. The method of claim 1, further comprising:

determining whether the balance is less than zero; and collecting from an insurer an amount by which the balance is less than zero.

6. The method of claim 1, in which the step of generating at least the predetermined number of outcomes comprises:

generating at least the predetermined number of outcomes without a corresponding number of commands to generate outcomes.

7. The method of claim 1, further comprising:

determining, based on the balance, an amount of winnings;

determining whether the amount of winnings exceeds a winnings threshold;

receiving a command to cash out; and

restricting an amount provided to the player based on the winnings threshold.

8. The method of claim 7, in which the step of restricting the amount provided to the player based on the winnings threshold comprises:

providing an amount that is not greater than a sum of an initial balance and an amount of winnings.

9. The method of claim 1, in which the step of adjusting a balance of the player device based on the outcomes comprises:

adjusting a balance of the player device based on the outcomes such that the balance does not exceed a threshold,

in which the threshold is a predetermined amount greater than an initial balance.

10. The method of claim 1, in which the step of adjusting a balance of the player device based on the outcomes comprises:

determining a tax amount; and

reducing the balance by the tax amount.

11. The method of claim 10, in which the step of determining the tax amount comprises:

determining for each of a plurality of winning outcomes, a respective amount by which an amount of winnings exceeds a predetermined threshold; and

reducing the balance by each of the respective amounts.

12. The method of claim 10, in which the step of determining the tax amount comprises:

determining, for each of a series of winning outcomes, a highest amount of winnings; and

reducing the balance by each of the respective amounts.

13. The method of claim 1, in which the step of adjusting a balance of the player device based on the outcomes comprises:

determining a tax amount; and

preventing payout of an amount that is based on the tax amount.

14. A method comprising:

receiving a payment from a player for a predetermined number of outcomes at a player device;

generating at least the predetermined number of outcomes;

adjusting a balance of the player device based on the outcomes;

determining whether the balance exceeds a predetermined threshold; and

paying an amount by which the balance exceeds the threshold.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT D**



US006638169B2

**(12) United States Patent**  
Wilder et al.**(10) Patent No.: US 6,638,169 B2**  
**(45) Date of Patent: Oct. 28, 2003****(54) GAMING MACHINES WITH DIRECTED SOUND****(75) Inventors:** Richard L. Wilder, Sparks, NV (US);  
William R. Wells, Reno, NV (US);  
Harold Mattice, Gardnerville, NV  
(US); Chauncey W. Griswold, Reno,  
NV (US)**(73) Assignee:** IGT, Reno, NV (US)**(\*) Notice:** Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 141 days.**(21) Appl. No.:** 09/966,860**(22) Filed:** Sep. 28, 2001**(65) Prior Publication Data**

US 2003/0064804 A1 Apr. 3, 2003

**(51) Int. Cl. 7** ..... A63F 13/02**(52) U.S. Cl.** ..... 463/35; 463/47**(58) Field of Search** ..... 463/35, 47; 381/382;  
273/148 B**(56) References Cited****U.S. PATENT DOCUMENTS**

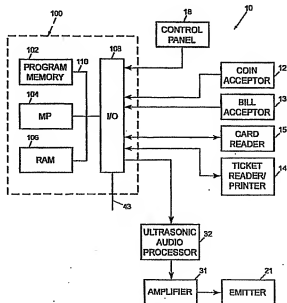
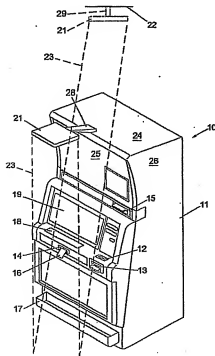
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*Primary Examiner*—Jessica Harrison*Assistant Examiner*—Yvesde Cherubin**(74) Attorney, Agent, or Firm**—Marshall, Gerstein & Borum  
LLP**(57)****ABSTRACT**

A casino gaming apparatus is disclosed which includes a controller programmed to generate an audio signal. The controller is operatively linked to an ultrasonic audio processor. The ultrasonic audio processor is programmed to convert the audio signal received from the controller into an ultrasonic signal. The ultrasonic signal is operatively linked to an ultrasonic emitter which emits the ultrasonic signal along a column of air in front of the gaming apparatus. The ultrasonic signal is demodulated into audible sounds along the column by interaction of the ultrasonic signal with air to produce audible sound substantially confined within the column. The column intersects the position where the player stands or sits. Accordingly, sounds are generated by the gaming apparatus are confined to an area occupied by the player and provide little or no distractions for players using adjacent gaming apparatuses.

**29 Claims, 14 Drawing Sheets**

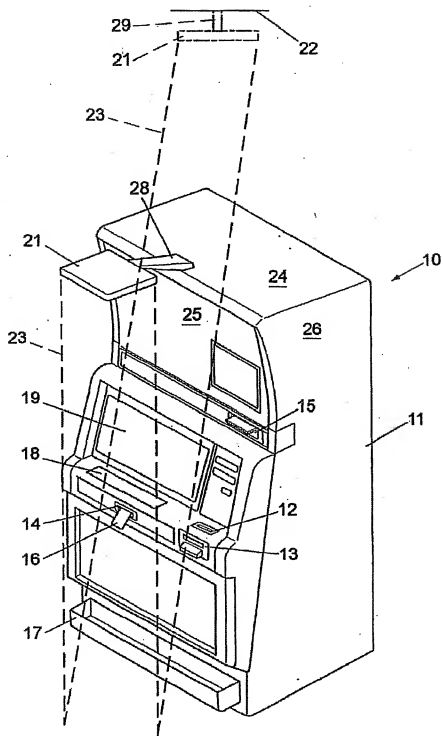


FIG. 1

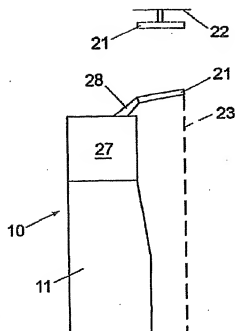


FIG. 2

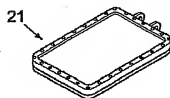


FIG. 3

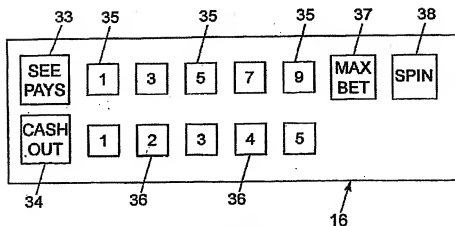


FIG. 4

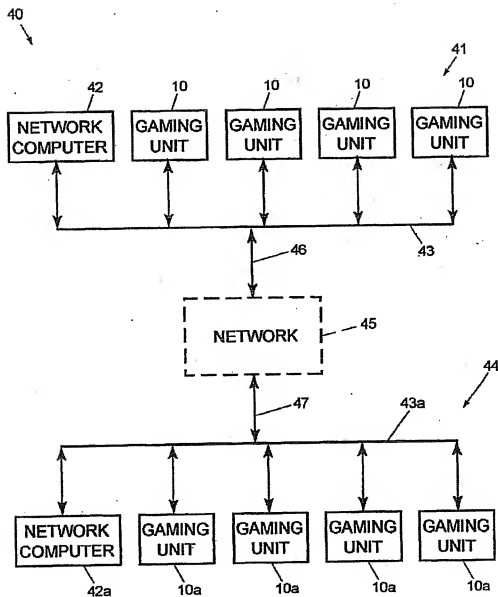


FIG. 5

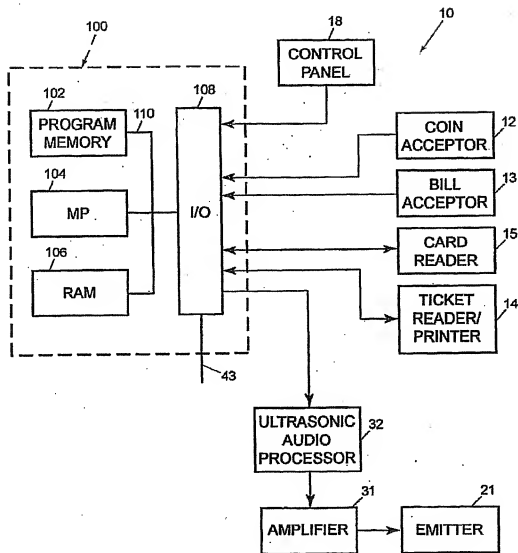


FIG. 6



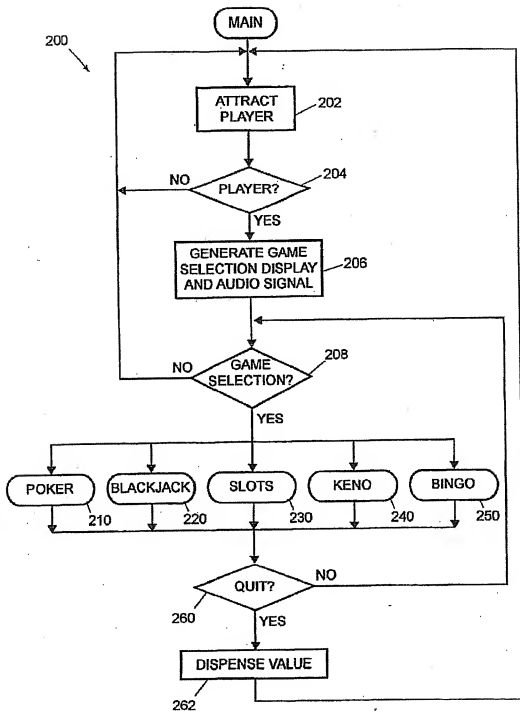


FIG. 7

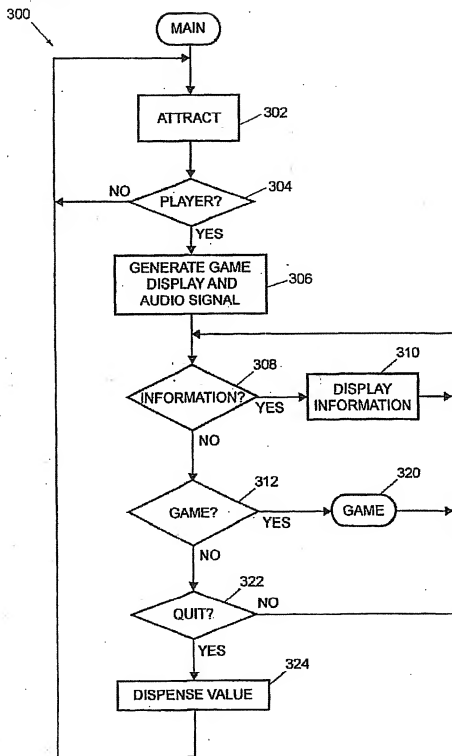


FIG. 8

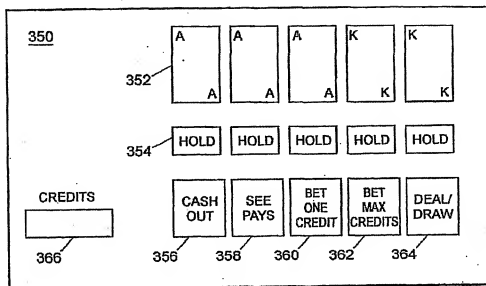


FIG. 9

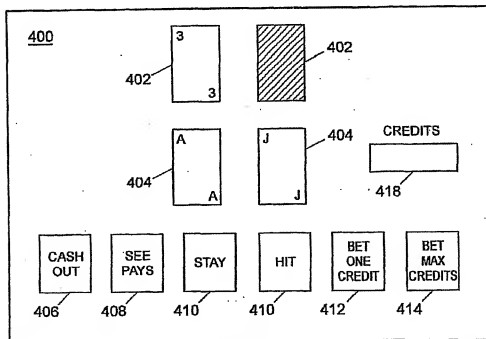


FIG. 10

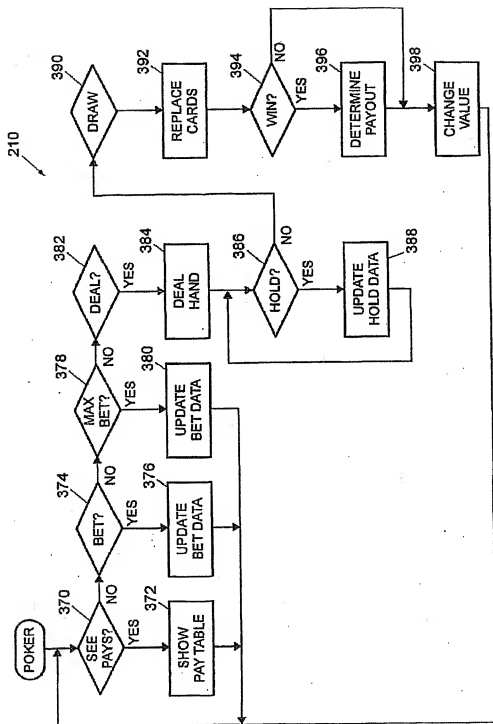


FIG. 11

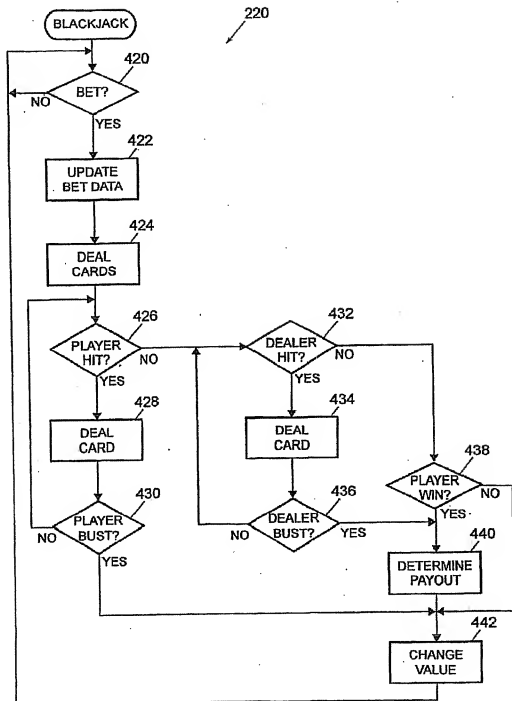


FIG. 12.

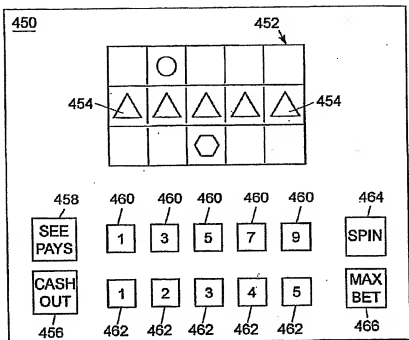


FIG. 13

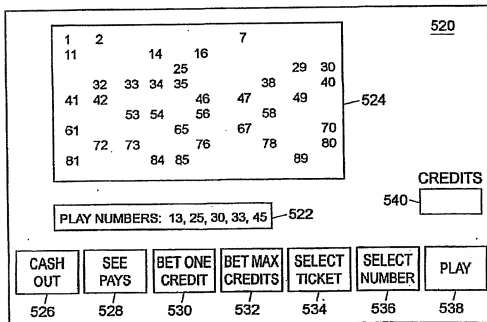


FIG. 14

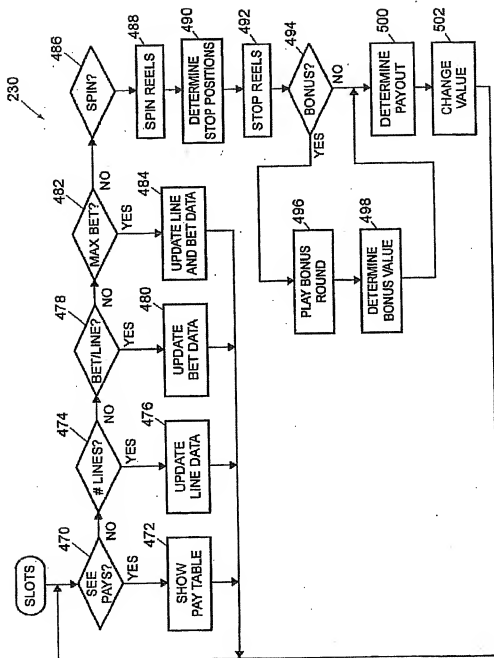


FIG. 15

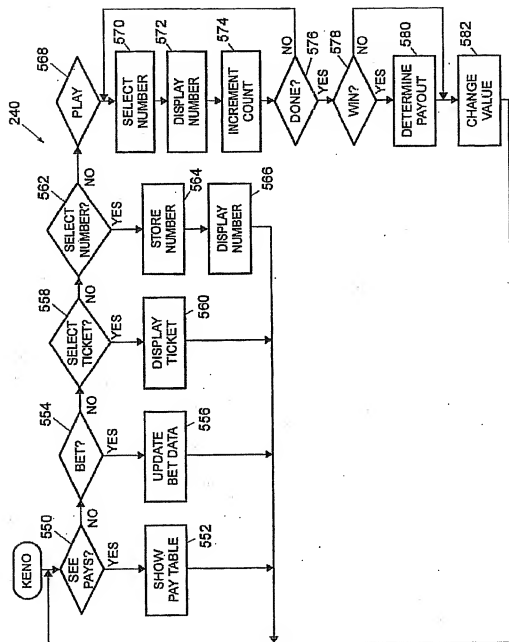


FIG. 16



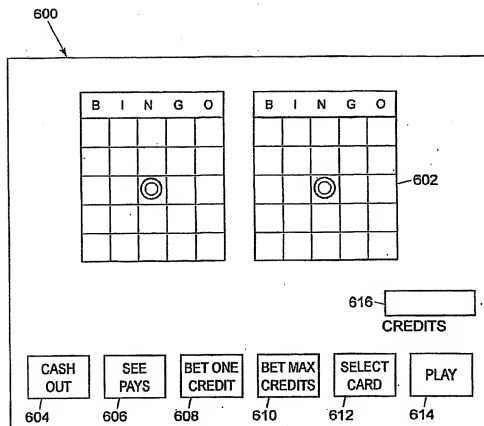


FIG. 17

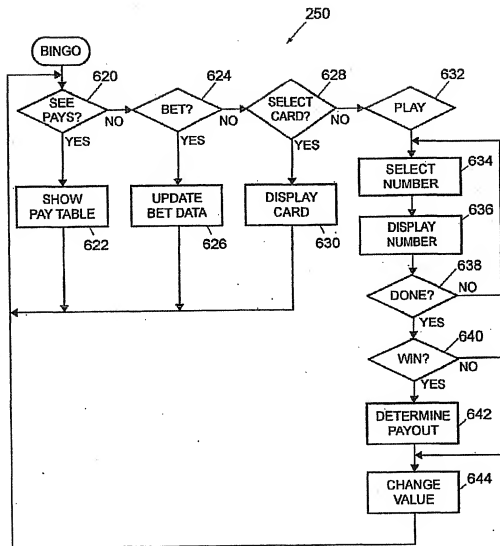


FIG. 18

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# GAMING MACHINES WITH DIRECTED SOUND

## BACKGROUND OF THE INVENTION

The invention relates generally to gaming machines and, more specifically, gaming machines with sound systems capable of generating directed sound so as to reduce or eliminate distractions to other players operating other machines in an adjoining area.

Casinos are crowded, noisy environments. The noise level in a casino is often disturbing to the players. One area of a casino that is particularly problematic is the gaming machine area, where gaming machines such as, for example, slot machines are closely spaced together.

Specifically, modern gaming machines generate large amounts of noise. Audible sounds are generated by the machines to attract players, provide audible instructions to players and to inform players of the outcome of the game being played. Additional audible sounds may also be used to generate excitement or suspense during the playing of a game. Finally, audible sounds may also be used by modern, computerized machines to simulate the sounds of mechanical slot machines which have largely been replaced by video slot machines.

While the use of audible sounds is an important facet of modern gaming machines, the large amounts of noise generated in the gaming machine area of a casino can be very distractive to the player. The large amounts of background noise can also be particularly irritating to players wearing hearing aids.

Thus, there is a need for a gaming machine which can generate audible sounds that are beneficial to the player and which add to the appeal of the game being played but which are also limited so as to reduce the level of distraction to other players in the immediate vicinity.

## SUMMARY OF THE INVENTION

In one aspect, the invention is directed to a gaming apparatus that may comprise a controller programmed to generate an audio signal. The controller is operatively linked to an ultrasonic audio processor. The ultrasonic audio processor is programmed to convert the audio signal received from the controller into an ultrasonic signal. The ultrasonic audio processor is operatively linked to an ultrasonic emitter. The ultrasonic emitter emits the ultrasonic signal received from the ultrasonic audio processor along a column of air in the front of the gaming apparatus. Interaction of the ultrasonic signal with the air results in a demodulation of the ultrasonic signal into audible sounds which are at least substantially confined to the column or air in front of the gaming apparatus. In this manner, the audio signals of the gaming apparatus are confined to a column of air or space disposed in front of the gaming apparatus. The emission of an ultrasonic signal and subsequent demodulation thereof results in audio sounds that are directed through the space which is occupied by the player. The only audible sounds generated by the gaming apparatus which can be heard in the immediate vicinity of the gaming apparatus are those audible sounds which are reflected, either off of the user or off of a surface which is struck by the audible sound waves.

Preferably, the column of air through which the ultrasonic signal is directed and demodulated is a vertical column. Because gaming apparatuses are typically placed on carpeted floors, which serve as poor sound reflectors and good

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sound absorbers, and further because a player's body and clothing are also poor sound reflectors and good sound absorbers, the majority of the audible sound waves generated by a gaming apparatus made in accordance with the present invention are not reflected to the adjoining areas and therefore do not cause distractions to other players playing nearby gaming apparatuses.

Accordingly, because it is preferred, but not required, to transmit the ultrasonic signal through a vertical column, preferred locations for mounting the ultrasonic emitter include the top of the gaming apparatus, a top portion of the front of the gaming apparatus or mounted to a wall or ceiling above the gaming apparatus so that the ultrasonic signal can be emitted downward towards the player or through a space normally occupied by the player. Another embodiment would include mounting the emitter on a lower portion of the gaming apparatus and having the ultrasonic signal emitted upward towards the user.

The invention is also directed to a gaming apparatus that may comprise a display unit that is capable of generating video images, a value input device and an ultrasonic processor programmed to convert audible signals into ultrasonic signals. The ultrasonic audio processor is operatively linked to an ultrasonic emitter. The ultrasonic emitter is capable of emitting ultrasonic signals within a column of air in front of the gaming apparatus. The ultrasonic signals are demodulated into audible sounds within the column by interaction of the ultrasonic signals with the air. A controller is operatively coupled to the display unit, the value input device and the ultrasonic audio processor. The controller is programmed to allow a person to make a wager and a payoff selection. The controller is also programmed to cause a video image to be generated on the display unit and to send an audio signal to the ultrasonic audio processor. The video image and audio signal may represent a game selected from the group of games consisting of video poker, video blackjack, video slots, video keno and video bingo. The controller is programmed to determine the outcome of the game represented by the audio signal and the video image and a value payout associated with the outcome of the game.

In another aspect, the invention is directed toward a gaming method which comprises causing a video game image and an audio signal to be generated. The video game image and the audio signal represent a game selected from the group consisting of video poker, video blackjack, video slots, video keno and video bingo. The audio signal comprises game instructions and an indication of the outcome of the game. The video game image comprises an image of at least five playing cards if the game is video poker, simulated slot machine reels if the game is video slots, a plurality of playing cards if the game is video blackjack, a plurality of keno numbers if the game is video keno and an image of a bingo grid if the game is video bingo. The method further comprises determining an outcome of the game represented by the video game images, determining a payout associated with the outcome of the game, converting the audio signal to an ultrasonic signal, emitting the ultrasonic signal along a column of air in front of the video image, i.e., where the player would stand, and demodulating the ultrasonic signal in the column with the air to produce audible sounds for the player that are confined or substantially confined within the column.

The features and advantages of the present invention will be apparent to those of ordinary skill in the art in view of the detailed description of various embodiments, which is made with reference to the drawings, a brief description of which is provided below.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an embodiment of a gaming unit in accordance with the present invention;

FIG. 2 is a side plan view of the gaming unit shown in FIG. 1;

FIG. 3 is a perspective view of an ultrasonic emitter of the gaming unit shown in FIGS. 1 and 2;

FIG. 4 illustrates an embodiment of a control panel for the gaming unit shown in FIGS. 1 and 2;

FIG. 5 is a block diagram of an embodiment of a gaming system in accordance with the invention;

FIG. 6 is a block diagram of the electronic components of the gaming unit of FIGS. 1 and 2;

FIG. 7 is a flowchart of an embodiment of a main routine that may be performed during operation of one or more of the gaming units;

FIG. 8 is a flowchart of an alternative embodiment of a main routine that may be performed during operation of one or more of the gaming units;

FIG. 9 is an illustration of an embodiment of a visual display that may be displayed during performance of the video poker routine of FIG. 11;

FIG. 10 is an illustration of an embodiment of a visual display that may be displayed during performance of the video blackjack routine of FIG. 12;

FIG. 11 is a flowchart of an embodiment of a video poker routine that may be performed by one or more of the gaming units;

FIG. 12 is a flowchart of an embodiment of a video blackjack routine that may be performed by one or more of the gaming units;

FIG. 13 is an illustration of an embodiment of a visual display that may be displayed during performance of the slots routine of FIG. 15;

FIG. 14 is an illustration of an embodiment of a visual display that may be displayed during performance of the video keno routine of FIG. 16;

FIG. 15 is a flowchart of an embodiment of a slots routine that may be performed by one or more of the gaming units;

FIG. 16 is a flowchart of an embodiment of a video keno routine that may be performed by one or more of the gaming units;

FIG. 17 is an illustration of an embodiment of a visual display that may be displayed during performance of the video bingo routine of FIG. 18; and

FIG. 18 is a flowchart of an embodiment of a video bingo routine that may be performed by one or more of the gaming units.

## DETAILED DESCRIPTION OF VARIOUS EMBODIMENTS

FIG. 1 is a perspective view of a gaming machine 10 made in accordance with the present invention. Although the following description addresses the design of the gaming unit 10, it should be understood that various designs for the gaming unit 10 can be utilized with the novel aspects of the present invention.

Referring to FIG. 1, the casino gaming unit 10 may include a housing or cabinet 11 and one or more input devices, which may include a coin slot or acceptor 12, a paper currency acceptor 13, a ticket reader/printer 14 and a card reader 15, which may be used to input value to the gaming unit 10. A value input device may include any device

that can accept value from a customer. As used herein, the term "value" may encompass gaming tokens, coins, paper currency, ticket vouchers, credit or debit cards, and any other object representative of value.

If provided on the gaming unit 10, the ticket reader/printer 14 may be used to read and/or print or otherwise encode ticket vouchers 16. The ticket vouchers 16 may be composed of paper or another printable or encodable material and may have one or more of the following informational items printed or encoded thereon: the casino name, the type of ticket voucher, a validation number, a bar code with control and/or security data, the date and time of issuance of the ticket voucher, redemption instructions and restrictions, a description of an award, and any other information that may be necessary or desirable. Different types of ticket vouchers 16 could be used, such as bonus ticket vouchers, cash-redemption ticket vouchers, casino chip ticket vouchers, extra game play ticket vouchers, merchandise ticket vouchers, restaurant ticket vouchers, show ticket vouchers, etc. The ticket vouchers 16 could be printed with an optically readable material such as ink, or data on the ticket vouchers 16 could be magnetically encoded. The ticket reader/printer 14 may be provided with the ability to both read and print ticket vouchers 16, or it may be provided with the ability to only read or only print or encode ticket vouchers 16. In the latter case, for example, some of the gaming units 10 may have ticket printers 14 that may be used to print ticket vouchers 16, which could then be used by a player in other gaming units 10 that have ticket readers 16.

If provided, the card reader 15 may include any type of card reading device, such as a magnetic card reader or an optical card reader, and may be used to read data from a card offered by a player, such as a credit card or a player tracking card. If provided for player tracking purposes, the card reader 15 may be used to read data from, and/or write data to, player tracking cards that are capable of storing data representing the identity of a player, the identity of a casino, the player's gaming habits, etc.

The gaming unit 10 may also include a coin payout tray 17, an input control panel 18, and a color video display unit 19 for displaying images relating to the game or games provided by the gaming unit 10. The input control panel 18 may be provided with a plurality of pushbuttons or touch-sensitive areas that may be pressed by a player to select games, make wagers, make gaming decisions 42, 42a, etc.

The gaming unit 10 includes an ultrasonic emitter 21 that can either be mounted to the gaming unit 10 as shown in FIG. 1 or mounted to a ceiling or wall 22 as shown in phantom in FIG. 1. The use of ultrasonic emitters 21 is intended either to replace or supplement the use of conventional audio speakers (not shown). The advantage of using the ultrasonic emitters 21 as opposed to audio speakers is to reduce the distraction caused by audible sounds from the gaming unit 10 to other players of other gaming units in the immediate vicinity. Specifically, the ultrasonic emitters 21 emit ultrasonic signals within a defined column such as those shown in phantom at 23 in FIG. 1. The defined column of space passes through the area where the player would stand to play the gaming unit 10. The ultrasonic signal emitted by the one or more ultrasonic emitters 21 is demodulated by interaction of the ultrasonic waves with air in the columns 23. The demodulation of the ultrasonic signals converts the ultrasonic signals into audible sounds which the player (not shown) can hear. However, instead of the audible sounds being widely scattered about the area surrounding the gaming unit 10, the audible sounds are substantially confined to the columns 23. The only sound that escapes the

columns 23 are those audible sound waves that are reflected off of the floor (not shown), the gaming unit 10 or the player's body (not shown).

Because an effective reflection of sound waves requires a substantially flat, non-porous planar surface, reflection off of the player or off of carpeted floor is minimal. In this way, the audible sounds generated by the gaming unit 10, by way of the emission of an ultrasonic signal by the one or more emitters 21 is substantially confined to the column or columns shown at 23 in FIG. 1. As a result, distraction to other players in the adjoining area by the audible sounds generated by the gaming unit 10 is minimized.

It will be noted that one ultrasonic emitter 21 is sufficient. However, a plurality of ultrasonic emitters 21 may be utilized. The ultrasonic emitters 21 may be mounted to the top surface 24, a front surface 25 or one of the side surfaces 26, 27 (see FIG. 2) of the gaming unit 10. Also, as shown in FIG. 1, the two emitters 21 illustrated are mounted above the player. It will also be noted that an emitter 21 could be mounted below a player and directed upward. A common bracket 28 or 29 can be used for purposes of mounting the emitter 21. A perspective view of an emitter 21 is shown in FIG. 3. Such ultrasonic emitters are sold under the trademark HYPERSONIC™ by American Technology Corporation of San Diego, Calif.

Turning briefly to FIG. 6, the emitter 21 is operatively linked to an amplifier 31 which, in turn, is operatively linked to an ultrasonic audio processor 32. The ultrasonic processor 32 receives an audio signal from the controller 100, converts that audio signal into an ultrasonic signal which is then amplified at the amplifier 31 and emitted by the emitter 21. Details of the operation of the emitter 21 can be found in U.S. Pat. No. 6,016,351.

The emitters 21 are relatively small, with current sizes having a width of about 10 inches and anticipated smaller embodiments having a width as small as 5 inches. The width of the resulting column 23 of audible sound transmission can vary from less than one foot to about four feet or more. Preferably, the column 23 has a width of less than or about four feet. The length of the column 23 of transmission can be varied by way of the amplifier 31.

FIG. 4 illustrates one possible embodiment of the control panel 18, which may be used where the gaming unit 10 is a slot machine having a plurality of mechanical or "virtual" reels. Referring to FIG. 4, the control panel 18 may include a "See Pays" button 33 that, when activated, causes the display unit 19 to payout one or more display screens showing the odds or payout information for the game or games provided by the gaming unit 10. As used herein, the term "button" is intended to encompass any device that allows a player to make an input, such as an input device that must be depressed to make an input selection or a display area that a player may simply touch. The control panel 18 may include a "Cash Out" button 34 that may be activated when a player desires to terminate play on the gaming unit 10, in which case the gaming unit 10 may return value to the player, such as by returning a number of coins to the player via the payout tray 17.

If the gaming unit 10 provides a slots game having a plurality of reels and a plurality of paylines which define winning combinations of reel symbols, the control panel 18 may be provided with a plurality of selection buttons 35, each of which allows the player to select a different number of paylines prior to spinning the reels. For example, five buttons 35 may be provided, each of which may allow a player to select one, three, five, seven or nine paylines.

If the gaming unit 10 provides a slots game having a plurality of reels, the control panel 18 may be provided with a plurality of selection buttons 36 each of which allows a player to specify a wager amount for each payline selected. For example, if the smallest wager accepted by the gaming unit 10 is a quarter (\$0.25), the gaming unit 10 may be provided with five selection buttons 36, each of which may allow a player to select one, two, three, four or five quarters to wager for each payline selected. In that case, if a player were to activate the "5" button 35 (meaning that five paylines were to be played on the next spin of the reels) and then activate the "3" button 36 (meaning that three coins per payline were to be wagered), the total wager would be \$3.75 (assuming the minimum bet was \$0.25).

The control panel 18 may include a "Max Bet" button 37 to allow a player to make the maximum wager allowable for a game. In the above example, where up to nine paylines were provided and up to five quarters could be wagered for each payline selected, the maximum wager would be forty-five quarters, or \$11.25. The control panel 18 may include a spin button 38 to allow the player to initiate spinning of the reels of a slots game after a wager has been made.

In FIG. 4, a rectangle is shown around the buttons 33-38. It should be understood that rectangle simply designates, for ease of reference, an area in which the buttons 33-38 may be located. Consequently, the term "control panel" should not be construed to imply that a panel or plate separate from the housing 11 of the gaming unit 10 is required, and the term "control panel" may encompass a plurality or grouping of player activatable buttons.

Although one possible control panel 18 is described above, it should be understood that different buttons could be utilized in the control panel 18, and that the particular buttons used may depend on the game or games that could be played on the gaming unit 10. Although the control panel 18 is shown to be separate from the display unit 19, it should be understood that the control panel 18 could be generated by the display unit 19. In that case, each of the buttons of the control panel 18 could be a colored area generated by the display unit 19, and some type of mechanism may be associated with the display unit 19 to detect when each of the buttons was touched, such as a touch-sensitive screen.

FIG. 5 illustrates an embodiment of a gaming system 40 in accordance with the invention. Referring to FIG. 5, the gaming system 40 may include a first group or network 41 of gaming units 10 operatively coupled to a network computer 42 via a network data link or bus 43. The gaming system 40 may include a second group or network 44 of gaming units 10a operatively coupled to a network computer 42a via a network data link or bus 43a. The first and second gaming networks 41, 44 may be operatively coupled to each other via a network 45, which may comprise, for example, the Internet, a wide area network (WAN), or a local area network (LAN) via a first network link 46 and a second network link 47.

The first network 41 of gaming units 10 may be provided in a first casino, and the second network 44 of gaming units 10a may be provided in a second casino located in a separate geographic location than the first casino. For example, the two casinos may be located in different areas of the same city, or they may be located in different states. The network 45 may include a plurality of network computers or server computers (not shown), each of which may be operatively interconnected. Where the network 45 comprises the Internet, data communication may take place over the communication links 46, 47 via an Internet communication protocol.

The network computer 42 may be a server computer and may be used to accumulate and analyze data relating to the operation of the gaming units 10. For example, the network computer 42 may continuously receive data from each of the gaming units 10 indicative of the dollar amount and number of wagers being made on each of the gaming units 10, data indicative of how much each of the gaming units 10 is paying out in winnings, data regarding the identity and gaming habits of players playing each of the gaming units 10, etc. The network computer 42a may be a server computer and may be used to perform the same or different functions in relation to the gaming units 10a as the network computer 42 described above.

Although each network 41, 44 is shown to include one network computer 42, 42a and four gaming units 10, 10a, it should be understood that different numbers of computers and gaming units may be utilized. For example, the network 41 may include a plurality of network computers 42 and tens or hundreds of gaming units 10, all of which may be interconnected via the data link 43. The data link 43 may be provided as a dedicated hardwired link or a wireless link. Although the data link 43 is shown as a single data link 43, the data link 43 may comprise multiple data links.

#### Gaming Unit Electronics

FIG. 6 is a block diagram of a number of components that may be incorporated in the gaming unit 10. Referring to FIG. 6, the gaming unit 10 may include a controller 100 that may comprise a program memory 102, a microcontroller or microprocessor (MP) 104, a random-access memory (RAM) 106 and an input/output (I/O) circuit 108, all of which may be interconnected via an address/data bus 110. It should be appreciated that although only one microprocessor 104 is shown, the controller 100 may include multiple microprocessors 104. Similarly, the memory of the controller 100 may include multiple RAMs 106 and multiple program memories 102. Although the I/O circuit 108 is shown as a single block, it should be appreciated that the I/O circuit 108 may include a number of different types of I/O circuits. The RAM(s) 104 and program memories 102 may be implemented as semiconductor memories, magnetically readable memories, and/or optically readable memories, for example.

FIG. 6 illustrates that the control panel 18, the coin acceptor 12, the bill acceptor 13, the card reader 15 and the ticket reader/printer 14 may be operatively coupled to the I/O circuit 108, each of those components being so coupled by either a unidirectional or bidirectional, single-line or multiple-line data link, which may depend on the design of the component that is used. The emitter(s) 21 may be operatively coupled to a sound circuit which may comprise an amplifier 31 and ultrasonic audio processor 32. The processor 32 may be coupled to the I/O circuit 108.

As shown in FIG. 6, the components 12-15, 21 and 31 may be connected to the I/O circuit 108 via a respective direct line or conductor. Different connection schemes could be used. For example, one or more of the components shown in FIG. 6 may be connected to the I/O circuit 108 via a common bus or other data link that is shared by a number of components. Furthermore, some of the components may be directly connected to the microprocessor 104 without passing through the I/O circuit 108.

#### Overall Operation of Gaming Unit

One manner in which one or more of the gaming units 10 (and one or more of the gaming units 10a) may operate is described below in connection with a number of flowcharts

which represent a number of portions or routines of one or more computer programs, which may be stored in one or more of the memories of the controller 100. The computer program(s) or portions thereof may be stored remotely, outside of the gaming unit 10, and may control the operation of the gaming unit 10 from a remote location. Such remote control may be facilitated with the use of a wireless connection, or by an Internet interface that connects the gaming unit 10 with a remote computer (such as one of the network computers 42, 42a) having a memory in which the computer program portions are stored. The computer program portions may be written in any high level language such as C, C++, or the like or any low-level, assembly or machine language. By storing the computer program portions therein, various portions of the memories 102, 106 are physically and/or structurally configured in accordance with computer program instructions.

FIG. 7 is a flowchart of a main operating routine 200 that may be stored in the memory of the controller 100. Referring to FIG. 7, the main routine 200 may begin operation at block 202 during which an attraction sequence may be performed in an attempt to induce a potential player in a casino to play the gaming unit 10. The attraction sequence may be performed by displaying one or more video images on the display unit 19 and/or causing one or more ultrasonic sound segments, such as voice or music, to be emitted via the emitter 21. The attraction sequence may include a scrolling list of games that may be played on the gaming unit 10 and/or video images of various games being played, such as video poker, video blackjack, video slots, video keno, video bingo, etc.

During performance of the attraction sequence, if a potential player makes any input to the gaming unit 10 as determined at block 204, the attraction sequence may be terminated and a game-selection display may be generated on the display unit 19 at block 206 to allow the player to select a game available on the gaming unit 10. The gaming unit 10 may detect an input at block 204 in various ways. For example, the gaming unit 10 could detect if the player presses any button on the gaming unit 10; the gaming unit 10 could determine if the player deposited one or more coins into the gaming unit 10; the gaming unit 10 could determine if player deposited paper currency into the gaming unit; etc.

The game-selection display generated at block 206 may include, for example, a list of video games that may be played on the gaming unit 10 and/or a combination of audio and visual messages to prompt the player to deposit value into the gaming unit 10. While the game-selection display is generated, the gaming unit 10 may wait for the player to make a game selection. Upon selection of one of the games by the player as determined at block 208, the controller 100 may cause one of a number of game routines to be performed to allow the selected game to be played. For example, the game routines could include a video poker routine 210, a video blackjack routine 220, a slots routine 230, a video keno routine 240, and a video bingo routine 250. At block 208, if no game selection is made within a given period of time, the operation may branch back to block 202.

After one of the routines 210, 220, 230, 240, 250 has been performed to allow the player to play one of the games, block 260 may be utilized to determine whether the player wishes to terminate play on the gaming unit 10 or to select another game. If the player wishes to stop playing the gaming unit 10, which wish may be expressed, for example, by selecting a "Cash Out" button 34, the controller 100 may dispense value to the player at block 262 based on the

outcome of the game(s) played by the player. The operation may then return to block 202. If the player did not wish to quit as determined at block 260, the routine may return to block 208 where the game-selection display may again be generated to allow the player to select another game.

It should be noted that although five gaming routines are shown in FIG. 7, a different number of routines could be included to allow play of a different number of games. The gaming unit 10 may also be programmed to allow play of different games.

FIG. 8 is a flowchart of an alternative main operating routine 300 that may be stored in the memory of the controller 100. The main routine 300 may be utilized for gaming units 10 that are designed to allow play of only a single game or single type of game. Referring to FIG. 8, the main routine 300 may begin operation at block 302 during which an attraction sequence may be performed in an attempt to induce a potential player in a casino to play the gaming unit 10. The attraction sequence may be performed by displaying one or more video images on the display unit 19 and/or causing one or more ultrasonic segments to be emitted via the emitter 21.

During performance of the attraction sequence, if a potential player makes any input to the gaming unit 10 as determined at block 304, the attraction sequence may be terminated and a game display and audio signal may be generated on the display unit 19 at block 306. The game display generated at block 306 may include, for example, an image of the casino game that may be played on the gaming unit 10 and/or a combination of audio and visual messages to prompt the player to deposit value into the gaming unit 10. At block 308, the gaming unit 10 may determine if the player requested information concerning the game, in which case the requested information may be displayed at block 310. Block 312 may be used to determine if the player requested initiation of a game, in which case a game routine 320 may be performed. The game routine 320 could be any one of the five game routines disclosed herein, such as one of the five game routines 210, 220, 230, 240, 250, or another game routine.

After the routine 320 has been performed to allow the player to play the game, block 322 may be utilized to determine whether the player wishes to terminate play on the gaming unit 10. If the player wishes to stop playing the gaming unit 10, which wish may be expressed, for example, by selecting a "Cash Out" button, the controller 100 may dispense value to the player at block 324 based on the outcome of the game(s) played by the player. The operation may then return to block 302. If the player did not wish to quit as determined at block 322, the operation may return to block 308.

#### Video Poker

FIG. 9 is an exemplary display 350 that may be shown on the display unit 19 during performance of the video poker routine 210 shown schematically in FIG. 7. Referring to FIG. 9, the display 350 may include video images 352 of a plurality of playing cards representing the player's hand, such as five cards. To allow the player to control the play of the video poker game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Hold" button 354 disposed directly below each of the playing card images 352, a "Cash Out" button 356, a "See Pays" button 358, a "Bet One Credit" button 360, a "Bet Max Credits" button 362, and a "Deal/Draw" button 364. The display 350 may also include an area 366 in which the number of remaining credits or value is displayed. If the display unit 19

is provided with a touch-sensitive screen, the buttons 354, 356, 358, 360, 362, 364 may form part of the video display 350. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 19.

FIG. 11 is a flowchart of the video poker routine 210 shown schematically in FIG. 7. Referring to FIG. 11, at block 370, the routine may determine whether the player has requested payout information, such as by activating the "See Pays" button 358, in which case at block 372 the routine may cause one or more pay tables to be displayed on the display unit 19. At block 374, the routine may determine whether the player has made a bet, such as by pressing the "Bet One Credit" button 360, in which case at block 376 bet data corresponding to the bet made by the player may be stored in the memory of the controller 100. At block 378, the routine may determine whether the player has pressed the "Bet Max Credits" button 362, in which case at block 380 bet data corresponding to the maximum allowable bet may be stored in the memory of the controller 100.

At block 382, the routine may determine if the player desires a new hand to be dealt, which may be determined by detecting if the "Deal/Draw" button 364 was activated after a wager was made. In that case, at block 384 a video poker hand may be "dealt" by causing the display unit 19 to generate the playing card images 352. After the hand is dealt, at block 386 the routine may determine if any of the "Hold" buttons 354 have been activated by the player, in which case data regarding which of the playing card images 352 are to be "held" may be stored in the controller 100 at block 388. If the "Deal/Draw" button 364 is activated again as determined at block 390, each of the playing card images 352 that was not "held" may be caused to disappear from the video display 350 and to be replaced by a new, randomly selected, playing card image 352 at block 392.

At block 394, the routine may determine whether the poker hand represented by the playing card images 352 currently displayed is a winner. That determination may be made by comparing data representing the currently displayed poker hand with data representing all possible winning hands, which may be stored in the memory of the controller 100. If there is a winning hand, a payout value corresponding to the winning hand may be determined at block 396. At block 398, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the hand was a winner, the payout value determined at block 396. The cumulative value or number of credits may also be displayed in the display area 366 (FIG. 9).

Although the video poker routine 210 is described above in connection with a single poker hand of five cards, the routine 210 may be modified to allow other versions of poker to be played. For example, seven card poker may be played, or stud poker may be played. Alternatively, multiple poker hands may be simultaneously played. In that case, the game may begin by dealing a single poker hand, and the player may be allowed to hold certain cards. After deciding which cards to hold, the held cards may be duplicated in a plurality of different poker hands, with the remaining cards for each of those poker hands being randomly determined.

#### Video Blackjack

FIG. 10 is an exemplary display 400 that may be shown on the display unit 19 during performance of the video blackjack routine 220 shown schematically in FIG. 7. Referring to FIG. 10, the display 400 may include video images

402 of a pair of playing cards representing a dealer's hand, with one of the cards shown face up and the other card being shown face down, and video images 404 of a pair of playing cards representing a player's hand, with both the cards shown face up. The "dealer" may be the gaming unit 10.

To allow the player to control the play of the video blackjack game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 406, a "See Pays" button 408, a "Stay" button 410, a "Hit" button 412, a "Bet One Credit" button 414, and a "Bet Max Credits" button 416. The display 400 may also include an area 418 in which the number of remaining credits or value is displayed. If the display unit 19 is provided with a touch-sensitive screen, the buttons 406, 408, 410, 412, 414, 416 may form part of the video display 400. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 19.

FIG. 12 is a flowchart of the video blackjack routine 220 shown schematically in FIG. 10. Referring to FIG. 12, the video blackjack routine 220 may begin at block 420 where it may determine whether a bet has been made by the player. That may be determined, for example, by detecting the activation of either the "Bet One Credit" button 414 or the "Bet Max Credits" button 416. At block 422, bet data corresponding to the bet made at block 420 may be stored in the memory of the controller 100. At block 424, a dealer's hand and a player's hand may be "dealt" by making the playing card images 402, 404 appear on the display unit 19.

At block 426, the player may be allowed to be "hit," in which case at block 428 another card will be dealt to the player's hand by making another playing card image 404 appear in the display 400. If the player is hit, block 430 may determine if the player has "bust" or exceeded twenty-one. If the player has not bust, blocks 426 and 428 may be performed again to allow the player to be hit again.

If the player decides not to hit, at block 432 the routine may determine whether the dealer should be hit. Whether the dealer hits may be determined in accordance with predetermined rules, such as the dealer always hit if the dealer's hand totals fifteen or less. If the dealer hits, at block 434 the dealer's hand may be dealt another card by making another playing card image 402 appear in the display 400. At block 436 the routine may determine whether the dealer has bust. If the dealer has not bust, blocks 432, 434 may be performed again to allow the dealer to be hit again.

If the dealer does not hit, at block 436 the outcome of the blackjack game and a corresponding payout may be determined based on, for example, whether the player or the dealer has the higher hand that does not exceed twenty-one. If the player has a winning hand, a payout value corresponding to the winning hand may be determined at block 440. At block 442, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the player won, the payout value determined at block 396. The cumulative value or number of credits may also be displayed in the display area 418 with an accompanying audio signal directed at the player (FIG. 10).

#### Slots

FIG. 13 is an exemplary display 450 that may be shown on the display unit 19 during performance of the slots routine 230 shown schematically in FIG. 7. Referring to FIG. 13, the display 450 may include video images 452 of a plurality of slot machine reels, each of the reels having a plurality of reel symbols 454 associated therewith. Although

the display 450 shows five reel images 452, each of which may have three reel symbols 454 that are visible at a time, other reel configurations could be utilized.

To allow the player to control the play of the slots game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 456, a "See Pays" button 458, a plurality of payoff-selection buttons 460 each of which allows the player to select a different number of paylines prior to "spinning" the reels, a plurality of bet-selection buttons 462 each of which allows a player to specify a wager amount for each payoff line selected, a "Spin" button 464, and a "Max Bet" button 466 to allow a player to make the maximum wager allowable.

FIG. 15 is a flowchart of the slots routine 230 shown schematically in FIG. 7. Referring to FIG. 15, at block 470, the routine may determine whether the player has requested payout information, such as by activating the "See Pays" button 458, in which case at block 472 the routine may cause one or more pay tables to be displayed on the display unit 19. At block 474, the routine may determine whether the player has pressed one of the payoff-selection buttons 460, in which case at block 476 data corresponding to the number of paylines selected by the player may be stored in the memory of the controller 100. At block 478, the routine may determine whether the player has pressed one of the bet-selection buttons 462, in which case at block 480 data corresponding to the amount bet per payoff line may be stored in the memory of the controller 100. At block 482, the routine may determine whether the player has pressed the "Max Bet" button 466, in which case at block 484 bet data (which may include both payoff line data and bet-per-payline data) corresponding to the maximum allowable bet may be stored in the memory of the controller 100.

If the "Spin" button 464 has been activated by the player as determined at block 486, at block 488 the routine may cause the slot machine reel images 452 to begin "spinning" so as to simulate the appearance of a plurality of spinning mechanical slot machine reels. At block 490, the routine may determine the positions at which the slot machine reel images will stop, or the particular symbol images 454 that will be displayed when the reel images 452 stop spinning. At block 492, the routine may stop the reel images 452 from spinning by displaying stationary reel images 452 and images of three symbols 454 for each stopped reel image 452. The virtual reels may be stopped from left to right, from the perspective of the player, or in any other manner or sequence.

The routine may provide for the possibility of a bonus game or round if certain conditions are met, such as the display in the stopped reel images 452 of a particular symbol 454. If there is such a bonus condition as determined at block 494, the routine may proceed to block 496 where a bonus round may be played. The bonus round may be a different game than slots, and many other types of bonus games could be provided. If the player wins the bonus round, or receives additional credits or points in the bonus round, a bonus value may be determined at block 498. A payout value corresponding to outcome of the slots game and/or the bonus round may be determined at block 500. At block 502, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the slot game and/or bonus round was a winner, the payout value determined at block 500.

Although the above routine has been described as a virtual slot machine routine in which slot machine reels are represented as images on the display unit 19, actual slot machine reels that are capable of being spun may be utilized instead.



FIG. 14 is an exemplary display 520 that may be shown on the display unit 19 during performance of the video keno routine 240 shown schematically in FIG. 7. Referring to FIG. 14, the display 520 may include a video image 522 of a plurality of numbers that were selected by the player prior to the start of a keno game and a video image 524 of a plurality of numbers randomly selected during the keno game. The randomly selected numbers may be displayed in a grid pattern.

To allow the player to control the play of the keno game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 526, a "See Pays" button 528, a "Bet One Credit" button 530, a "Bet Max Credits" button 532, a "Select Ticket" button 534, a "Select Number" button 536, and a "Play" button 538. The display 520 may also include an area 540 in which the number of remaining credits or value is displayed. If the display unit 19 is provided with a touch-sensitive screen, the buttons may form part of the video display 520. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 19.

FIG. 16 is a flowchart of the video keno routine 240 shown schematically in FIG. 7. The keno routine 240 may be utilized in connection with a single gaming unit 10 where a single player is playing a keno game, or the keno routine 240 may be utilized in connection with multiple gaming units 10 where multiple players are playing a single keno game. In the latter case, one or more of the acts described below may be performed either by the controller 100 in each gaming unit or by one of the network computer 42, 42a to which multiple gaming units 10 are operatively connected.

Referring to FIG. 16, at block 550, the routine may determine whether the player has requested payout information, such as by activating the "See Pays" button 528, in which case at block 552 the routine may cause one or more pay tables to be displayed on the display unit 19. At block 554, the routine may determine whether the player has made a bet, such as by having pressed the "Bet One Credit" button 530 or the "Bet Max Credits" button 532, in which case at block 556 bet data corresponding to the bet made by the player may be stored in the memory of the controller 100. After the player has made a wager, at block 558 the player may select a keno ticket, and at block 560 the ticket may be displayed on the display 520. At block 562, the player may select one or more game numbers, which may be within a range set by the casino. After being selected, the player's game numbers may be stored in the memory of the controller 100 at block 564 and may be included in the image 522 on the display 520 at block 566. After a certain amount of time, the keno game may be closed to additional players (where a number of players are playing a single keno game using multiple gaming units 10).

If play of the keno game is to begin as determined at block 568, at block 570 a game number within a range set by the casino may be randomly selected either by the controller 100 or a central computer operatively connected to the controller, such as one of the network computers 42, 42a. At block 572, the randomly selected game number may be displayed on the display unit 19 and the display units 19 of other gaming units 10 (if any) which are involved in the same keno game. At block 574, the controller 100 (or the central computer noted above) may increment a count which keeps track of how many game numbers have been selected at block 570.

At block 576, the controller 100 (or one of the network computers 42, 42a) may determine whether a maximum number of game numbers within the range have been randomly selected. If not, another game number may be randomly selected at block 570. If the maximum number of game numbers has been selected, at block 578 the controller 100 (or a central computer) may determine whether there are a sufficient number of matches between the game numbers selected by the player and the game numbers selected at block 570 to cause the player to win. The number of matches may depend on how many numbers the player selected and the particular keno rules being used.

If there are a sufficient number of matches, a payout may be determined at block 580 to compensate the player for winning the game. The payout may depend on the number of matches between the game numbers selected by the player and the game numbers randomly selected at block 570. At block 582, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the keno game was won, the payout value determined at block 580. The cumulative value or number of credits may also be displayed in the display area 540 (FIG. 14).

#### Video Bingo

FIG. 17 is an exemplary display 600 that may be shown on the display unit 19 during performance of the video bingo routine 250 shown schematically in FIG. 7. Referring to FIG. 17, the display 600 may include one or more video images 602 of a bingo card and images of the bingo numbers selected during the game. The bingo card images 602 may have a grid pattern.

To allow the player to control the play of the bingo game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 604, a "See Pays" button 606, a "Bet One Credit" button 608, a "Bet Max Credits" button 610, a "Select Card" button 612, and a "Play" button 614. The display 600 may also include an area 616 in which the number of remaining credits or value is displayed. If the display unit 19 is provided with a touch-sensitive screen, the buttons may form part of the video display 600. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 19.

FIG. 18 is a flowchart of the video bingo routine 250 shown schematically in FIG. 7. The bingo routine 250 may be utilized in connection with a single gaming unit 10 where a single player is playing a bingo game, or the bingo routine 250 may be utilized in connection with multiple gaming units 10 where multiple players are playing a single bingo game. In the latter case, one or more of the acts described below may be performed either by the controller 100 in each gaming unit 10 or by one of the network computers 42, 42a to which multiple gaming units 10 are operatively connected.

Referring to FIG. 18, at block 620, the routine may determine whether the player has requested payout information, such as by activating the "See Pays" button 606, in which case at block 622 the routine may cause one or more pay tables to be displayed on the display unit 19. At block 624, the routine may determine whether the player has made a bet, such as by having pressed the "Bet One Credit" button 608 or the "Bet Max Credits" button 610, in which case at block 626 bet data corresponding to the bet made by the player may be stored in the memory of the controller 100.

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After the player has made a wager, at block 628 the player may select a bingo card, which may be generated randomly. The player may select more than one bingo card, and there may be a maximum number of bingo cards that a player may select. After play is to commence as determined at block 632, at block 634 a bingo number may be randomly generated by the controller 100 or a central computer such as one of the network computers 42, 42a. At block 636, the bingo number may be displayed on the display unit 19 and the display units 19 of any other gaming units 10 involved in the bingo game.

At block 638, the controller 100 (or a central computer) may determine whether any player has won the bingo game. If no player has won, another bingo number may be randomly selected at block 634. If any player has bingo as determined at block 638, the routine may determine at block 640 whether the player playing that gaming unit 10 was the winner. If so, at block 642 a payout for the player may be determined. The payout may depend on the number of random numbers that were drawn before there was a winner, the total number of winners (if there was more than one player), and the amount of money that was wagered on the game. At block 644, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the bingo game was won, the payout value determined at block 642. The cumulative value or number of credits may also be displayed in the display area 616 (FIG. 17).

Numerous modifications and alternative embodiments of the invention will be apparent to those skilled in the art in view of the foregoing description. This description is to be construed as illustrative only, and is for the purpose of teaching those skilled in the art the best mode of carrying out the invention. The details of the structure and method may be varied substantially without departing from the spirit of the invention, and the exclusive use of all modifications which come within the scope of the appended claims is reserved.

What is claimed is:

1. A gaming apparatus, comprising:  
a controller programmed to generate an audio signal,  
said controller being operatively linked to an ultrasonic audio processor,  
said ultrasonic audio processor programmed to convert said audio signal received from said controller into an ultrasonic signal,  
said ultrasonic audio processor being operatively linked to an ultrasonic emitter,  
said ultrasonic emitter emitting the ultrasonic signal along a predetermined column of air,  
said ultrasonic signal being demodulated into audible sounds along the column by interaction of said ultrasonic signal with said air.
2. A gaming apparatus as defined in claim 1 wherein said column is vertical and has a width of less than or about four feet.
3. A gaming apparatus as defined in claim 1 wherein said column of air is disposed in front of the gaming apparatus.
4. A gaming apparatus as defined in claim 1 wherein said gaming apparatus comprises a top surface, and wherein said emitter is mounted to said top surface.
5. A gaming apparatus as defined in claim 1 wherein said gaming apparatus comprises a front surface, and wherein said emitter is mounted to said front surface.
6. A gaming system comprising a plurality of gaming apparatuses as defined in claim 1, said gaming apparatuses being interconnected to form a network of gaming apparatuses.

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7. A gaming system as defined in claim 6, wherein said gaming apparatuses are interconnected via the Internet.

8. A gaming apparatus as defined in claim 1, wherein said gaming apparatus further comprises:

- a display unit that is capable of generating video images;  
a value input device;

said controller operatively coupled to said display unit and said value input device,

said controller being programmed to allow a person to make a wager;

said controller being programmed to cause a video image to be generated on said display unit, said video image and said audio signal representing a game selected from the group of games consisting of video poker, video blackjack, video slots, video keno and video bingo,

said audio signal comprising game instructions and an indication of an outcome of said game,

said video image comprising an image of at least five playing cards if said game comprises video poker, said video image comprising an image of a plurality of simulated slot machine reels if said game comprises video slots,

said video image comprising an image of a plurality of playing cards if said game comprises video blackjack,

said video image comprising an image of a plurality of keno numbers if said game comprises video keno,

said video image comprising an image of a bingo grid if said game comprises video bingo,

said controller being programmed to determine the outcome of said game represented by said audio signal and said video image and a value payout associated with said outcome of said game.

9. A gaming apparatus as defined in claim 8 wherein said column is vertical and has a width of less than or about four feet.

10. A gaming apparatus as defined in claim 8 wherein said column is disposed in front of the gaming apparatus.

11. A gaming apparatus as defined in claim 8 wherein said gaming apparatus comprises a top surface, and wherein said emitter is mounted to said top surface.

12. A gaming apparatus as defined in claim 8 wherein said gaming apparatus comprises a front surface, and wherein said emitter is mounted to said front surface.

13. A gaming system comprising a plurality of gaming apparatuses as defined in claim 8, said gaming apparatuses being interconnected to form a network of gaming apparatuses.

14. A gaming system as defined in claim 13, wherein said gaming apparatuses are interconnected via the Internet.

15. A gaming apparatus as defined in claim 1, wherein said gaming apparatus further comprises:

- a display unit that is capable of generating video images;  
a value input device;

said controller operatively coupled to said display unit and said value input device,

said controller being programmed to allow a person to make a wager;

said controller being programmed to cause a video image to be generated on said display unit, said video image and said audio signal representing a casino game,

said controller being programmed to determine, after said video image has been displayed and after said audio signal has been sent to the ultrasonic audio

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processor, an outcome of said casino game represented by said video image and said audio signal and to determine a value payout associated with said outcome of said casino game.

16. A gaming apparatus as defined in claim 15 wherein said column is vertical and has a width of less than or about four feet.

17. A gaming apparatus as defined in claim 15 wherein said column of air is disposed in front of the gaming apparatus.

18. A gaming apparatus as defined in claim 15 wherein said gaming apparatus comprises a top surface, and wherein said emitter is mounted to said top surface.

19. A gaming apparatus as defined in claim 15 wherein said gaming apparatus comprises a front surface, and wherein said emitter is mounted to said front surface.

20. A gaming system comprising a plurality of gaming apparatuses as defined in claim 15, said gaming apparatuses being interconnected to form a network of gaming apparatuses.

21. A gaming system as defined in claim 20, wherein said gaming apparatuses are interconnected via the Internet.

22. A gaming apparatus, comprising:

a display unit that is capable of generating video images; a value input device;

an ultrasonic audio processor programmed to convert audio signals into ultrasonic signals, said ultrasonic audio processor being operatively linked to an ultrasonic emitter,

said ultrasonic emitter capable of emitting ultrasonic signals along a predetermined column of air, said ultrasonic signals being demodulated into audible sounds along the column by interaction of said ultrasonic signals with air,

a controller operatively coupled to said display unit, said value input device and said ultrasonic audio processor, said controller being programmed to allow a person to make a wager,

said controller being programmed to allow a person to make a payline selection,

said controller being programmed to cause a video image to be generated on said display unit and to send an audio signal to the ultrasonic audio processor, said video image comprising a plurality of simulated slot machine reels of a slots game, each of said slot machine reels having a plurality of slot machine symbols, said audio signal simulating rotating slot machine reels and further comprising instructions and a declaration of the outcome of said slots game,

said controller being programmed to determine an outcome of said slots game represented by said video image, audio signal and a value payout associated with said outcome of said slots game, said controller

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being programmed to determine said outcome of said slots game based on a configuration of said slot machine symbols.

23. A gaming apparatus as defined in claim 22 wherein said column is vertical and has a width of less than or about four feet.

24. A gaming apparatus as defined in claim 22 wherein said column of air is disposed in front of the gaming apparatus.

25. A gaming apparatus as defined in claim 22 wherein said gaming apparatus comprises a top surface, and wherein said emitter is mounted to said top surface.

26. A gaming apparatus as defined in claim 22 wherein said gaming apparatus comprises a front surface, and wherein said emitter is mounted to said front surface.

27. A gaming system comprising a plurality of gaming apparatuses as defined in claim 22, said gaming apparatuses being interconnected to form a network of gaming apparatuses.

28. A gaming system as defined in claim 27, wherein said gaming apparatuses are interconnected via the Internet.

29. A gaming method comprising:

causing a video game image and an audio signal to be generated, said video game image and said audio signal representing a game selected from the group of games consisting of video poker, video blackjack, video slots, video keno and video bingo,

said audio signal comprising game instructions and an indication of an outcome of said game,

said video game image comprising an image of at least five playing cards if said game comprises video poker,

said video game image comprising an image of a plurality of simulated slot machine reels if said game comprises video slots,

said video game image comprising an image of a plurality of playing cards if said game comprises video blackjack,

said video game image comprising an image of a plurality of keno numbers if said game comprises video keno, and

said video game image comprising an image of a bingo grid if said game comprises video bingo;

determining an outcome of said game represented by said video game images;

determining a value payout associated with said outcome of said game;

converting said audio signal to an ultrasonic signal; emitting said ultrasonic signal along a predetermined column of air adjacent said video image; and

demodulating said ultrasonic signal in said column with said air to produce audible sounds within said column.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT E**



US007107245B1

(12) **United States Patent**  
**Kowalik**(10) Patent No.: **US 7,107,245 B1**  
(45) Date of Patent: **Sep. 12, 2006**(54) **BIOMETRIC GAMING ACCESS SYSTEM**(75) Inventor: **Gregory Kowalik, Langhorne, PA (US)**(73) Assignee: **Gaming System Technologies, LLC, Las Vegas, NV (US)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/552,887

(22) Filed: Apr. 20, 2000

(51) Int. Cl. **G06G 40/00** (2006.01)

(52) U.S. Cl. .... 705/44; 705/39; 713/182; 713/184; 713/186; 235/380; 382/115

(58) Field of Classification Search .... 235/382, 235/380, 379; 705/39, 44, 37, 36, 35, 5; 304/5.61, 10.41, 5.75; 380/25; 382/115, 382/124; 713/186, 172, 182, 184; G01S 5/18  
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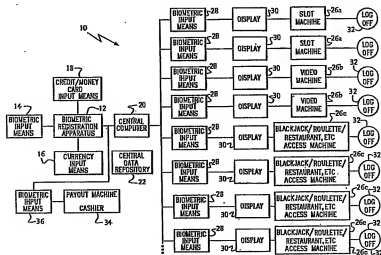
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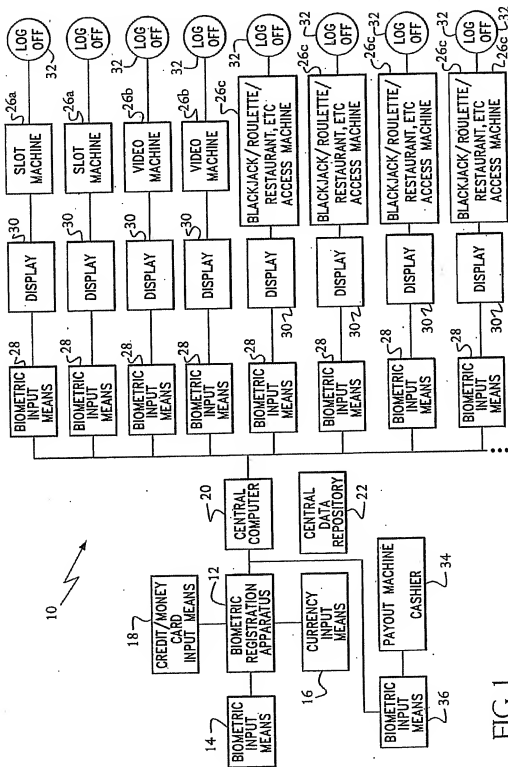
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Primary Examiner—Hyung Sough  
Assistant Examiner—Harish T. Dass  
(74) Attorney, Agent, or Firm—Caesar, Rivise, Bernstein, Cohen & Pokotilow, Ltd.

(57) **ABSTRACT**

A method for cashless and tokenless access to casino machines is provided including the steps of providing a biometric registration apparatus connected to a computer having an input for a user to input a biometric sample and a payment input. The player registers including the steps of inputting a biometric sample into the biometric input and inputting money. The money is input into a unique player's account in the central computer associated with the biometric sample of the player. The player is identified at a gaming machine by the entering of a biometric sample and comparing it to the unique biometric data stored in the central computer. The player is then authorized to play and his account is credited or debited based on the player's wins and losses. The player is then paid any money remaining in his account after the player no longer desires to play by entering a biometric sample to access his account.

**29 Claims, 4 Drawing Sheets**



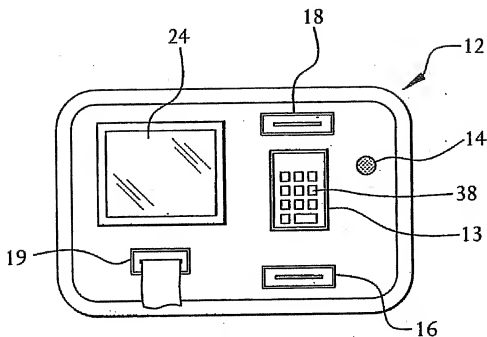


FIG. 2

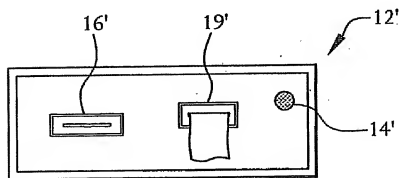


FIG. 3

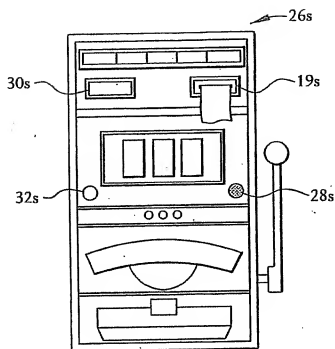


FIG. 4

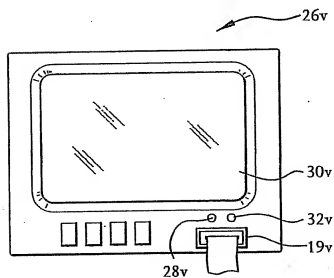


FIG. 5



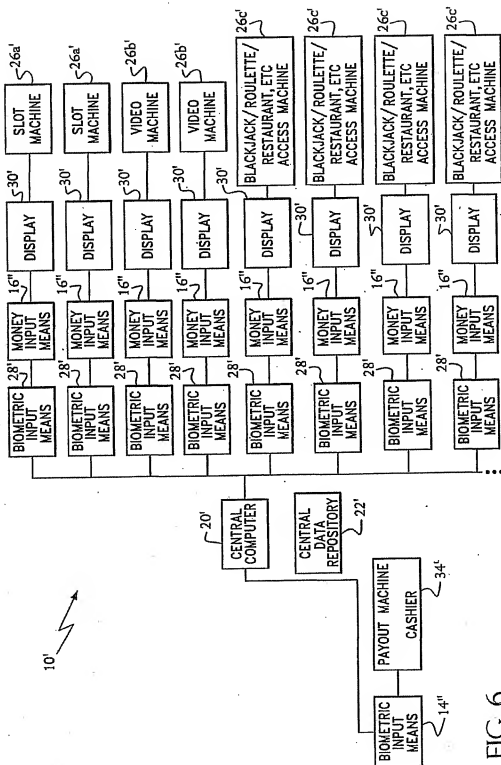


FIG. 6

## BIOMETRIC GAMING ACCESS SYSTEM

## BACKGROUND OF THE INVENTION

This invention relates generally to casino gaming and, more particularly, to an improved system for operating cashless and tokenless gaming apparatus using an account accessed solely by a biometric sample.

Various means to use biometric samples are known, including use of fingerprints, hand prints, voice prints, retinal images, handwritten samples, and the like. Presently, most biometric data are stored on a token in electronic form, such as on a smart card or the like. Thus, the biometric data for a particular individual can be fraudulently copied and reproduced, for example, if a card is lost or stolen.

A tokenless biometric ATM access system is disclosed in U.S. Pat. No. 5,764,789 wherein a customer registers with a computer system. Here, the customer registers a personal identification number (PIN), one or more biometric samples, and one or more financial accounts. The customer initiates account access at an ATM or other financial device by entering the customer's personal authentication information which includes a PIN and a biometric sample. The personal authentication information is compared with the registration biometric sample to produce a successful or failed identification of the customer. If there is a successful identification of the customer, the customer is allowed to access the account.

This system positively identifies a person's identity to that person's specific account or accounts. In any typical bank or other financial account where a user has access to ATM machines, essential to the transaction is the relating of numerous details concerning the particular person to a particular account where that person is known to the bank or financial institution by address, social security number, birth date, and the like. The present system is not necessarily concerned with a person's details of his identity, such as social security number and the like. The present system is concerned with relay a only a particular biometric sample to a financial account. The person need not be identified further. Thus, effectively, the account is held in the level of the biometric sample, rather than in the name of the person. This allows for a certain level of anonymity that numerous gaming patrons deem to be of great importance. Thus, this system may be more similar to a system that uses currency. Of course, on the other hand, if desired, the present system allows a gaming organization to keep detailed records of the details of specific gaming patrons and groups of gaming patrons. Obviously, if desired, an alternate embodiment of the present system would give the gaming organization the ability to tie a particular biometric sample to a particular gaming patron and track that patron's activity within the system.

Finally, U.S. Pat. No. 6,012,039 (Hoffman et al.) discloses a tokenless biometric electronic rewards system where a recipient registers a biometric sample. The system authorizes reward transactions and the debiting and crediting of reward units from a reward recipient's electronic account, either at the retail point of sale or over the internet. The rewards recipient is not required to directly use any man-made personalized token in order to effect the transaction.

## OBJECTS OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a biometric gaming access system.

It is a further object of the present invention to provide a biometric gaming access system that provides for play at casino games without the need to carry currency or tokens during play.

It is still a further object of the present invention to provide a biometric gaming access system that utilizes a central account opened solely with a biometric sample and an amount of money, where a plurality of gaming apparatus may be played utilizing the central account with access obtained by the biometric sample.

It is still a further object of the present invention to provide a biometric gaming access system that utilizes an account accessed by a biometric sample of a fingerprint, hand print, voice print, retinal image, or the like, at a plurality of gaming apparatus.

It is still a further object of the present invention to provide a biometric gaming access system that utilizes an account accessed by a biometric sample and, optionally, a personal identification number (PIN).

It is yet another object of the present invention to provide a biometric gaming access system that utilizes an account accessed by a biometric sample at a plurality of gaming apparatus and gives account information on a display.

It is still another object of the present invention to provide a biometric gaming access system where a player does not have to be concerned with losing cash, a debit or credit card or a cash-out voucher.

It is a further object of this invention to provide a biometric gaming access system where a gaming organization can track players' use of various machines and amounts used by a particular player.

It is a still further object of the present invention to provide a biometric gaming access system that utilizes gaming apparatus that require less labor to maintain due to the apparatus not requiring to dispense cash or tokens.

It is a still further object of the present invention to provide a biometric gaming access system that reduces fraud.

It is a still further object of the present invention to provide a biometric gaming access system that does not require a token to be used that can be lost.

It is still a further object of the present invention to provide a biometric gaming access system that operates in a commercially acceptable time frame, for example, in less than five seconds.

## SUMMARY OF THE INVENTION

These and other objects of this invention are achieved by providing a method for cashless and tokenless access to casino machines including the steps of providing a biometric registration apparatus connected to a computer having an input for a use to input a biometric sample and a payment input. The player registers including the steps of inputting a biometric sample into the biometric input and inputting money. The money is input into a unique player's account in the central computer associated with the biometric sample of the player. The player is identified at a gaming machine by the element of a biometric sample and comparing it to the unique biometric data stored in the central computer. The player is then authorized to play and this account is credited or debited based on the player's wins and losses. The player is then paid any money remaining in his account after the player no longer desires to play by entering a biometric sample to access his account. The account can be kept indefinitely for future play on a gaming machine within the system.

## DESCRIPTION OF THE DRAWINGS

Other objects and many attendant features of this invention will become readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

FIG. 1 is a schematic diagram of a biometric gaming access system in accordance with one preferred embodiment of the present invention.

FIG. 2 is a simplified front elevation view of a biometric registration apparatus for use with the biometric gaming access system of FIG. 1.

FIG. 3 is a simplified front elevation view of an alternate biometric registration apparatus for use with the biometric gaming access system of FIG. 1.

FIG. 4 is a simplified front view of a slot machine for use with the biometric gaming access system of FIG. 1.

FIG. 5 is a simplified front view of a video gaming machine having a touch screen for use with the biometric gaming access system of FIG. 1.

FIG. 6 is a schematic diagram of a biometric gaming access system in accordance with a second preferred embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like reference numbers refer to like parts throughout the several views, there is shown in FIG. 1 a schematic diagram of a biometric access system 10 in accordance with one preferred embodiment of the present invention. As can be seen in FIGS. 1 and 2, a player desiring to access various gaming apparatus, including slot machines, video machines, and the like, first registers at a biometric registration apparatus 12. There, the player provides an appropriate biometric to a biometric input means 14. For example, the biometric input means 14 could be based on one or more fingerprint, hand print, voice print, retinal image, or the like. Once the biometric registration apparatus 12 acknowledges acceptance of the biometric sample, a player then "cashes in", to the biometric registration apparatus 12 by providing a desired amount of currency to a currency input means 16 such as a bill validator as known in the art, or by providing a credit card, debit card, or other money access card to a card input means 18 as are known in the art. If the card input means 18 is used, the player authorizes an appropriate dollar amount, for example 50 or 100 dollars on an input device 13 (see FIG. 2) on the biometric registration apparatus 12. Based on this information the biometric registration apparatus 12 creates a unique player's account where account information is stored on a central computer 20 connected to the biometric registration apparatus 12. The computer 20 has a central data repository 22 containing unique players' accounts for all players on the system. This computer 20 may be a personal computer, main frame computer, or any other computer that meets the requirements of the present invention. The biometric registration apparatus 12 may optionally provide a paper receipt via a receipt slot 19 and/or provide a display 24 indicating the unique player's account information (see FIG. 2).

FIG. 2 depicts a simplified biometric region apparatus 12 which includes a biometric input means 14, a currency input means 16 in the form of a bill validator, a card reader 18, a display 24 and keypad 38 on an input device 13, and a receipt slot 19. FIG. 3 depicts a simplified biometric registration

apparatus 12' that only has a biometric input means 14', a bill validator 16' and a receipt slot 19'.

It must be noted here that the registration process only requires input of a biometric and input of money in some form. No personal data beyond the biometric is required, thereby providing at least some level of anonymity to the player. However, optionally, additional personal information can be requested or required. A gaming organization may desire to collect information concerning its patrons. Obtaining this information by a biometric as indicated above can be accomplished quickly and nonintrusively.

Once a player has successfully registered onto the system by providing the biometric sample and money, the player then may proceed to any slot machine 26a, video machine 26b, or other access machine 26c in the system and begin play. When the player selects the desired machine that is equipped with the required apparatus as described herein, he provides the appropriate biometric to a biometric input means 28 for which the machine is capable of reading, for example, a fingerprint. See, for example, FIG. 4 which depicts a slot machine 26a, a thumbprint scanner as biometric input means 28a, a display 30a, a logoff button 32a and a receipt slot 19a. Likewise, see, for example, FIG. 5 which depicts a video gaming machine 26b, a thumbprint scanner as biometric input means 28b, a display 30b which is incorporated in the gaming machine's touch screen, a logoff button 32b, and a receipt slot 19b. The desired machine will then communicate back to the central computer 20 to obtain account information based on that biometric sample. Preferably, a display 30 on the machine will then indicate the account balance. Additional information may be provided on the display if that information is available. For example, the display, may indicate "Good Morning Mr. Smith. You have \$255.00 in your account." The player then begins play with his account balance increasing or decreasing according to the players wins and losses.

Once the player decides to cease playing on the particular machine, that player logs off the machine by pressing a logoff means 32 such as a button, or if the machine has a proximity sensor logoff as described below, the machine would log off automatically when the player leaves. The player could then move to another slot machine 26a, video machine 26b or other access machine 26c on the system, provide the appropriate biometric sample and again begin play. Once a player is finished all play and desires to "cash out," the player then proceeds to a payout machine or a cashier 34 (or he may cash out a specific machine as described below). There, again, the player provides the appropriate biometric sample to a biometric input means 36, and receives the balance of the money in his unique player's account. Typically, the player would only be required to register once, so long as a balance remains in the player's unique player's account.

Additionally, a biometric registration apparatus 12, including associated biometric input means 14, and card input means 18 anchor currency input means can be incorporated into all or a plurality of gaming machines 26a, 26b, 26c, etc. This could eliminate a need for a separate biometric registration apparatus kiosk. For example a gaming patron could enter a casino, insert money and a thumbprint to a slot machine to create an account. That player could play that machine, then logoff and move to another machine and log on by applying his thumbprint to the new machine. As long as the player's account does not drop to zero, he can continue moving from machine to machine in this manner. Additionally, one or more gaming machines may optionally

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have the ability to payout a part or all of that player's account, assuming that player properly logs onto the machine with his thumb.

In an alternate embodiment of the present invention, as depicted schematically in FIG. 6, a modified version of the system 10' is shown. Here, a separate initial registration step is not required. In this system, a gaming player can merely start playing a gaming machine such as a slot machine 26d', video machine 26b', or generic machine 26c' in a conventional manner using, for example money or a card. The player can collect his winnings in a conventional manner, by collecting his winning at the machine or using a voucher issued by the machine. However, here, rather than collecting his winnings, the player may now provide an appropriate biometric sample to a biometric input means 28' on the machine 26d', 26b', 26c'. A central computer 20' would then create an account which relates the biometric sample to the balance in the account. The player could then move to another machine within the system and insert that same biometric sample into the machine. The machine would access the account associated with that biometric sample and allow the account to be credited or debited as appropriate. Whenever that player wishes to close the account, he can either have the machine pay out, or move to a separate payout machine or cashier 34', again provide the appropriate biometric sample to a biometric input means 14" on the machine to access his account, and obtain his account balance. Again, a display 30' may be provided. The primary difference in the embodiment of FIG. 6 and the embodiment of FIG. 1 is that no initial registration step is required prior to play. In this manner, a player does not have to decide until after he is finished playing each. Same as to whether or not he wishes to obtain the balance in the machine. A player can also play several machines by inserting an amount of money in each. As he leaves each machine the player would then optionally collect the money remaining/winnings at the machine or insert the appropriate biometric sample, building his account each time he leaves a machine, if there is any money remaining in the account.

Additional security measures can optionally be used in addition to providing the biometric sample. For example, during both the registration process and during access to the various gaming machines, a player may be required to provide additional personal information, including a PIN number, social security number, address, or the like to, for example, a key pad 38.

Ideally, most or all of the major manufacturers of gaming machines would manufacture machines that utilize the present system and all would be connected back to the central computer, within a particular system. A player is able to move from gaming machine to gaming machine by merely providing the appropriate biometric sample, without having to use debit cards or cash-out slips, or the like. When a player moves from one machine to another, his account would automatically be credited or debited through the central computer 20. Therefore, a player can freely move from machine to machine keeping a single account. As indicated above, once a player is finished play on a particular gaming machine, that player would log off the machine to prevent another from playing on his account. Here, numerous means to reduce fraud may be utilized. For example, the system may be set up to allow for only one player to play on a single account such that if that player moves to a second machine without logging off the first machine would automatically log off. In any event, since the unique player's account may only be accessed by one player, only that player could ultimately collect any account balance since the

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biometric sample is required to be presented for payment. Another possible way to reduce fraud associated with the present system would be to include a proximity sensor for logging off, as known, for example for plumbing in some public restrooms, that automatically logs a user or player off the machine when that user walks away from that machine.

The system may also be used for other related monetary transactions. For example, a biometric input means with associated access machine might be placed at kiosks in various other locations around a casino or hotel. Such an apparatus might be placed at a restaurant such that a player can deduct a dinner bill from his balance. Likewise, in any other facility within the hotel that requires payment of money, including spas, fitness clubs, cocktail lounges, shops, sports facilities, theaters, and the like, may use the biometric gaming access system 10 of the present invention. Special generic biometric gaming access machines can be provided that allow such transactions or gaming play (for example blackjack or roulette) from a unique user's account. Here, the user would register at the biometric registration apparatus and then register at the generic biometric access machine. The dealer or other person then would credit or debit the account accordingly.

Additionally, the system may be used on a more widespread network. For example, the central computer may extend to other hotels or casinos within a particular area, or even nationally or internationally. The system could likewise extend beyond the gaming industry where the private account and security of the present system is desired, but the privacy associated with this system, which as indicated above, only requires a biometric to open an account and not necessarily a name, address, social security number, or the like. No further information is required.

Another possible application is for use of the present system by a movie or other type of theater. Here, a player could register in the same manner as described above with respect to gaming. A player would provide the appropriate biometric any time he wished to enter the movie theater. His unique account would be adjusted accordingly. Of course, this application could be applied to substantially any retail establishment.

An obvious benefit to the present system is that players would not be required to carry around large amounts of money or credit/debit cards after the initial buy-in, particularly coins, that might be heavy and burdensome. Gaming facilities around pools or beaches would greatly benefit.

If the gaming organization or other organization using this device desires to use the device to track usage, the gaming organization could provide additional benefits to the player based on that player's known usage. For example, a player might receive bonus play for playing the gaming machines for a particular period of time. Additionally, usage tracking may be used to determine which machines are more popular with certain demographic groups, by requesting that additional identifiers be supplied during the registration process. Promotional activities could also be better targeted based on information obtained.

Another advantage of the present system is that, ultimately, the machines require less labor to service since, if no actual money was inserted or dispensed, there would be fewer moving parts, no coin bins to empty or fill, and the like.

As indicated above, use of the present invention would also substantially decrease bad since accounts are kept, transactions are recorded, and there are no credit cards, vouchers, or other tokens that are used after registration that may be stolen. It is unlikely that a player would attempt to

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use another's credit card during the registration process, since a biometric such as a fingerprint must be provided.

The gaming organization would benefit because the amount of play per machine, per hour, will likely increase because the player is buying in only once and does not have to buy in at each machine they play. Additionally, the gaming machines would not have down time caused by the requirement to fill and refill hoppers.

Finally, another unique application of the present invention is that, based on the player tracking information obtained, other unique games may be devised. For example, a feature that may be added to the gaming device is an instant winner game. In this example, the central computer of the present invention may be programmed to randomly select a biometric registered in its system within the last hour, day, week, or the like. When a player registers and moves from machine to machine, if the biometric matches the biometric that the central computer has randomly selected, that player becomes an instant winner of a prize.

Without further elaboration, the foregoing will so fully illustrate our invention that others may, by applying current or future knowledge, readily adopt the same for use under various conditions of service.

I claim:

1. A method for cashless and tokenless access to a plurality of casino gaming apparatus, said method comprising the steps of:

- (a) providing a tokenless biometric registration apparatus having at least one registration biometric input means for a player to input a biometric sample, said biometric registration apparatus having at least one payment input means, said biometric registration apparatus connected to a central computer having a central data repository;
- (b) providing the plurality of gaming apparatus, each gaming apparatus connected to said central computer, each gaming apparatus having at least one gaming apparatus biometric input means and a player logoff means;
- (c) registering a player comprising the steps of inputting at least one biometric sample of the player into the registration biometric input means, storing unique biometric data created by the biometric input means in the central data repository but not associating the unique biometric data with other details of identity of the player, inputting into the payment input means an amount of money, creating a unique player's account in the central computer associated with the at least one biometric sample of the player and storing the amount of money input in the unique player's account;
- (d) identifying said player at one of said plurality of gaming apparatus by said player entering a gaming apparatus biometric sample input into said one of said plurality of gaming apparatus biometric input means and comparing said biometric sample input to said unique biometric data stored in said central data repository;
- (e) authorizing said player at said one of said plurality of gaming apparatus to play on said one of said plurality of gaming apparatus;
- (f) debiting and or crediting said unique player's account based on the player's wins and losses at the gaming apparatus until said player logs off using said player logoff means or until said player's account is exhausted; and
- (g) paying said player any money remaining in said player's account after said player no longer desires to play;

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whereby a player can move to another of the plurality of gaming apparatus, input a biometric sample into one of the at least one gaming apparatus biometric input means, play the gaming apparatus for a period of time, and log off the gaming apparatus, said unique player's account being credited and debited for wins and losses on the gaming apparatus.

2. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, wherein the step of providing the plurality of gaming apparatus with the player logoff means includes providing a player logoff proximity sensor.

3. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, wherein the step of providing the plurality of gaming apparatus with the player logoff means includes providing a player logoff button.

4. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, where the step of paying said player money remaining in said player's account includes providing a payout machine having a payout biometric input means.

5. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 4, where the step of providing the payout machine includes providing a payout machine that is integral to at least one of said casino gaming apparatus.

6. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, where the steps including providing the registration biometric input means and the gaming apparatus biometric input means that utilize fingerprints, hand prints, retina scans, or voice prints.

7. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, where the step including providing the payment input means includes providing a payment input means that accepts credit cards, debit cards, or money access cards.

8. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, where the step including providing the payment input means includes providing a payment input means that accepts currency.

9. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, where the step of providing the plurality of gaming apparatus includes providing slot machines and video gaming machines.

10. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, where the step of providing the plurality of gaming apparatus includes providing generic access machines.

11. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, further including the step of collecting player data related to players' use of said plurality of casino gaming apparatus to the central computer having the central data repository.

12. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 11, where the player data collected includes data concerning type of casino gaming apparatus, quantity of casino gaming apparatus played, time spent on each casino gaming apparatus, and money spent on each casino gaming apparatus.

13. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, including the step of providing a keypad on the biometric

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registration apparatus for using a PIN and wherein the step of registering a player includes entering a PIN.

14. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 1, wherein the step of providing the plurality of gaming apparatus includes providing gaming apparatus having a video screen for displaying information related to the player's unique player's account.

15. A method for cashless and tokenless access to a financial account, said method comprising the steps of:

- (a) providing a tokenless biometric registration apparatus having at least one registration biometric input means for a user to input a biometric sample, said biometric registration apparatus having at least one payment input means, said biometric registration apparatus connected to a central computer having a central data repository;
- (b) providing a plurality of kiosks, each kiosk connected to said central computer, each kiosk having at least one kiosk biometric input means;
- (c) registering a user comprising the steps of inputting at least one biometric sample of the user into the registration biometric input means, storing unique biometric data created by the biometric input means in the central data repository but not associating the unique biometric data with other details of identity of the user, inputting into the payment input means an amount of money, creating a unique user's account in the central computer associated with the at least one biometric sample of the user and storing the amount of money input in the unique user's account;
- (d) identifying said user at one of said plurality of kiosks by said user entering a kiosk biometric sample input into said one of said plurality of kiosk biometric input means and comparing said biometric sample input to said unique biometric data stored in said central data repository;
- (e) authorizing said user at said one of said plurality of kiosks to access said unique user's account for a transaction;
- (f) debiting and or crediting said unique user's account based on the transaction; and
- (g) paying said user any money remaining in said user's account, when said user desires to cancel said unique user's account.

16. A method for cashless and tokenless access to a financial account according to claim 15, where the steps including providing the registration biometric input means and the kiosk biometric input means that utilize fingerprints, hand prints, retina scans, or voice prints.

17. A method for cashless and tokenless access to a financial account according to claim 15, where the step including providing the payment input means includes providing a payment input means that accepts credit cards, debit cards, or money access cards.

18. A method for cashless and tokenless access to a financial account according to claim 15 where the step including providing the payment input means includes providing a payment input means that accepts currency.

19. A method for cashless and tokenless access to a financial account according to claim 15, including the step of purging the unique biometric data and the unique user's account from the central computer after the step of paying said user any money remaining in said user's account, to provide for privacy of the user.

20. A method for cashless and tokenless access to a financial account according to claim 15, including the step

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of providing a keypad on the biometric registration apparatus for using a PIN and wherein the step of registering a user includes entering a PIN.

21. A method for cashless and tokenless access to a financial account according to claim 15, wherein the step of providing the plurality of kiosks includes providing kiosks having a video screen for displaying information related to the user's unique user's account.

22. A method for cashless and tokenless access to a plurality of casino gaming apparatus, said method comprising the steps of:

- (a) providing the plurality of gaming apparatus, each gaming apparatus connected to a central computer having a central data repository, each gaming apparatus having at least one gaming apparatus biometric input means and a money input means;
- (b) allowing a player to play on any of said gaming apparatus by inputting money into said money input means;
- (c) after the player plays on a gaming apparatus, registering said player comprising the steps of inputting at least one biometric sample of the player into the gaming apparatus biometric input means, storing unique biometric data created by the biometric input means in the central data repository but not associating the unique biometric data with other details of identity of the player, creating a unique player's account in the central computer associated with the at least one biometric sample of the player, crediting to the unique player's account in the central computer an amount of money associated with the at least one biometric sample of the player;
- (d) allowing a player to play on another of said gaming apparatus by inputting money into said money input means or by accessing said unique player's account of said player by inputting said biometric sample of said player into the gaming apparatus biometric input means and comparing said biometric sample to said unique biometric data stored in said central data repository;
- (e) debiting and or crediting said unique player's account based on the player's wins and losses at said another gaming apparatus until said player logs off by exhausting his account, collecting his winnings, or until said player inputs the biometric sample of said player into said gaming apparatus biometric input means; and
- (f) comparing said biometric sample to said biometric data stored in said central data repository and crediting or debiting said unique player's account accordingly; whereby a player can move to another of the plurality of gaming apparatus, input a biometric sample into one of the at least one gaming apparatus biometric input means, play the gaming apparatus for a period of time, and log off the gaming apparatus, said unique player's account being credited and debited for wins and losses on the gaming apparatus.

23. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 22, where the step of paying said player money remaining in said player's account includes providing a payout machine having a payout biometric input means.

24. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 23, where the step of providing the payout machine includes providing a payout machine that is integral to at least one of said casino gaming apparatus.

25. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 22,

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where the steps including providing the gaming apparatus biometric input means that utilizes fingerprints, hand prints, retina scans, or voice prints.

26. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 22, 5 where the step including providing the payment input means includes providing a payment input means that accepts credit cards, debit cards, or money access cards.

27. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 22, 10 where the step including providing the payment input means includes providing a payment input means that accepts currency.

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28. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 22, where the step of providing the plurality of gaming apparatus includes providing slot machines and video gaming machines.

29. A method for cashless and tokenless access to a plurality of casino gaming apparatus according to claim 22, where the step of providing the plurality of gaming apparatus includes providing generic access machines.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT F**





US006634942B2

(12) **United States Patent**  
Walker et al.(10) Patent No.: **US 6,634,942 B2**  
(45) Date of Patent: **Oct. 21, 2003**

- (54) **SYSTEM AND METHOD FOR AUTOMATED PLAY OF MULTIPLE GAMING DEVICES**
- (76) Inventors: Jay S. Walker, 124 Spectacle La., Ridgefield, CT (US) 06877; James A. Joraszch, 25 Forest St., Apt. 5G, Stamford, CT (US) 06901; Thomas M. Sparico, 115 Lockwood Rd., Riverside, CT (US) 06878
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(21) Appl. No.: 09/879,299

(22) Filed: Jun. 12, 2001

(65) **Prior Publication Data**

US 2001/0031654 A1 Oct. 18, 2001

**Related U.S. Application Data**

- (63) Continuation-in-part of application No. 09/473,204, filed on Nov. 9, 1999, now Pat. No. 6,244,957, which is a continuation of application No. 08/774,487, filed on Dec. 30, 1996, now Pat. No. 6,012,983.

- (51) Int. Cl.<sup>7</sup> ..... A63B 71/00
- (52) U.S. Cl. .... 463/20
- (58) Field of Search ..... 463/16, 20, 70, 463/40; 273/292, 293, 143 R

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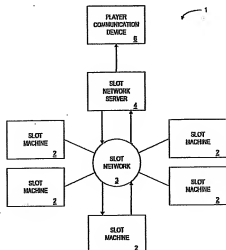
Primary Examiner—Stephen F. Gerrity

(74) Attorney, Agent, or Firm—Michael D. Downs

(57)

**ABSTRACT**

A method according to one embodiment of the present invention provides for: receiving a request for an automated session, in which the automated session comprises a plurality of games; initiating a first game of the automated session, the first game corresponding to a first gaming device; and initiating a second game of the automated session, the second game corresponding to a second gaming device.

**35 Claims, 10 Drawing Sheets**

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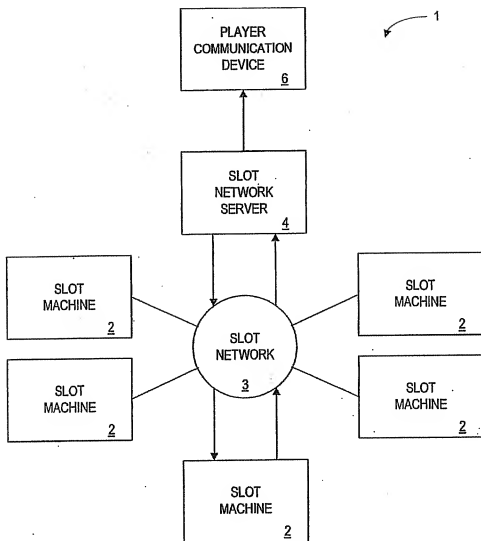


FIG. 1

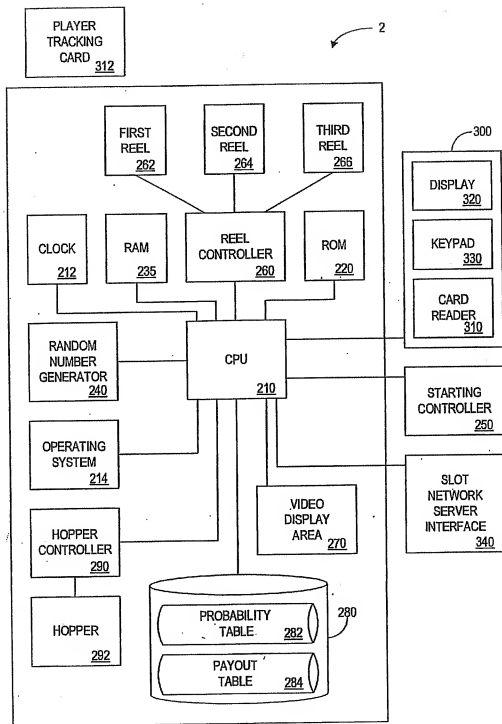


FIG. 2

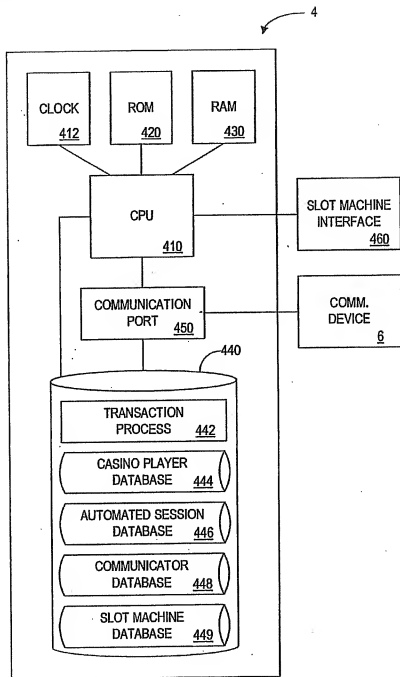


FIG. 3

444  
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NAME 4440	SOCIAL SECURITY NUMBER 4441	PLAYER ID 4442	ADDRESS 4443	PHONE NUMBER 4444	CREDIT CARD NUMBER 4445	CREDIT CARD BALANCE 4446	COMP. INFO 4447	HOTEL ROOM 4448	PLAYER STATUS RATING 4449

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:  
:


FIG. 4

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→

PLAYER ID 4460	MACHINE ID NUMBER 4461	LOCK START TIME 4462	LOCK END TIME 4463	MAXIMUM NUMBER OF PULLS 4464	LIMITING CREDIT BALANCE 4465	LIMITED MAXIMUM PAYOUT 4466	BET PER PULL 4467	TIME BETWEEN PULLS 4468	COMM. DEVICE NUMBER 4469

FIG. 5

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COMMUNICATION DEVICE NUMBER <u>4480</u>	COMMUNICATOR IDENTIFIER <u>4481</u>	PLAYER ID <u>4482</u>	COMMUNICATION TIME OUT <u>4483</u>	COMMUNICATION TIME IN <u>4484</u>

FIG. 6



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↘

MACHINE ID NUMBER 4491	MACHINE TYPE 4492	MACHINE DENOMINATIONS 4493	MAXIMUM COINS 4494	PAYOUT STRUCTURE 4495	REEL POSITIONS 4496	PAYOUT 4497

FIG. 7

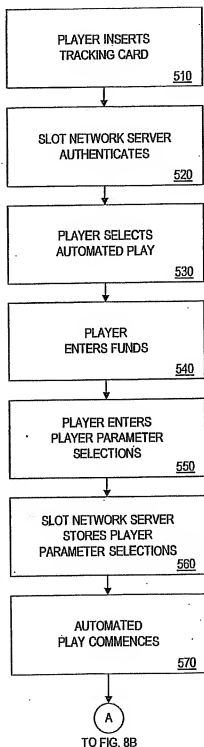


FIG. 8A

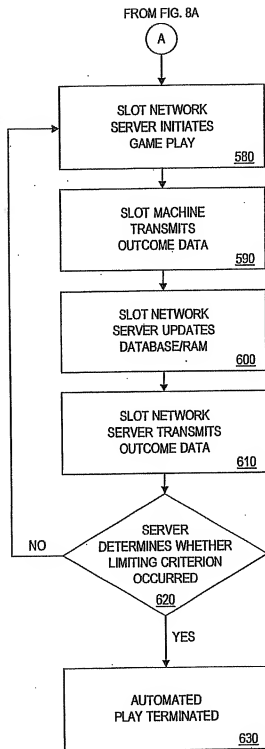


FIG. 8B

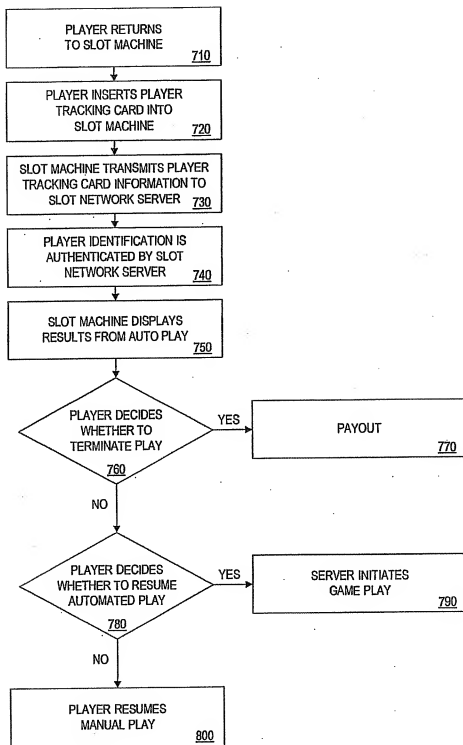


FIG. 9

# SYSTEM AND METHOD FOR AUTOMATED PLAY OF MULTIPLE GAMING DEVICES

## CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 09/437,204 "AUTOMATED PLAY GAMING DEVICE" filed Nov. 9, 1999 now U.S. Pat. No. 6,244,957, which is a continuation of Ser. No. 08/774,487 now U.S. Pat. No. 6,012,983 "AUTOMATED PLAY GAMING DEVICE" filed Dec. 30, 1996 and granted Jan. 11, 2000. Each of the above is incorporated herein by reference.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates generally to a method and apparatus for initiating and terminating automated play of a gaming device (or multiple gaming devices), such as a slot machine.

### 2. Description of Related Art

There are numerous types of gaming devices in use today. Most of these gaming devices, such as slot machines, video blackjack machines, video poker devices, or the like, require the player of the device to be physically present during game play. Specifically, the player must be present to continuously feed money into the gaming device, initiate each play of the device, and receive any payout from the device. The requirement of a physical presence is not only a hardship on a player, as will be further described below, but also results in substantial down-time to the casino owner of the gaming device. While casinos typically have a large capital investment in gaming devices, and particularly slot machines, these devices go unused a large portion of the time. For example, late at night, between successive players, and during inclement weather, are times when such devices may go largely unused.

For a player, a constant presence at a gaming device may comprise both a physical and emotional hardship. For example, a player may wish to leave the gaming device momentarily to have a dinner or take a short rest before returning to the machine. In other instances, the player may wish to leave for an extended period to attend a show, play a round of golf, or the like.

Despite wanting to leave the gaming device, the player often will desire to continue playing. Because a player's stay at a casino is limited, a player will often want to maximize the playing time, thereby increasing the chances of winning. For instance, a player may attempt to play at multiple gaming devices at the same time. Moreover, a player often desires to continue playing the same gaming device or devices because the player believes that the chance of winning at a particular device or devices is great.

In response to a desire to physically leave a gaming device yet continue playing it, players have been known to manually "lock-up" a device. Such manual locking-up of a device has typically been achieved by placing a "reserved" sign on the device or, in the case of slot machines, placing a change cup on the pull handle. In theory, by manually locking-up a device, a player prevents others from playing that device until the player returns to resume play.

In practice, however, manually locking-up a gaming device has several disadvantages. Manually locking-up a device is ineffectual as there can be no guarantee that other players will respect the indication that the device is locked-up. Despite the "reserved" sign or the change cup on the

handle, another player may still operate the manually locked-up device. During such an apparent lock-up, the device is really reserved, not physically secured. Even if no other player begins play on the locked-up device, the time away from the device is lost; not only has the player lost opportunities to hit a jackpot, but also the owner of the device has lost significant revenue by allowing the device to go unused. Thus, there is a need for a method and system for automated play of a gaming device (or multiple gaming devices) in a continuous gaming mode while the player is away from the device(s).

The game of Keno resembles automated play. A game of Keno consists of matching a series of player-selected numbers against a series of numbers drawn by the Keno system. Once the player has selected the series of numbers, the player selects a certain number of games for which those numbers are valid. Thus, by selecting several games, the player may bet on future games without further interaction with the system.

Despite proceeding without interaction between the player and the Keno system, there is neither true automated play nor device lock-up in Keno. The numbers are drawn by the system and broadcast or transmitted to a number of screens throughout an establishment, such as a casino. An unlimited number of players can attempt to match the numbers drawn. Thus, each screen displaying the numbers drawn by the system need not be locked-up. Furthermore, the Keno games continue indefinitely, without regard to either (i) a particular player's status, (ii) a particular player's participation, or (iii) the outcome of a prior game. Thus, while the number drawings in Keno may occur in a continuous manner, there is no automated play for a particular customer.

## SUMMARY OF THE INVENTION

A method according to one embodiment of the present invention provides for: receiving a request for an automated session, in which the automated session comprises a plurality of games, initiating a first game of the automated session, the first game corresponding to a first gaming device; and initiating a second game of the automated session, the second game corresponding to a second gaming device.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an overall schematic view of a system according to one embodiment of the present invention, including a slot machine, a slot network server, and a player communication device;

FIG. 2 is a schematic view of the slot machine of FIG. 1; FIG. 3 is a schematic view of the slot network server of FIG. 1, including a player database, automated session database, communication device database, and slot machine database;

FIG. 4 is a schematic view of the player database of FIG. 3;

FIG. 5 is a schematic view of the automated session database of FIG. 3;

FIG. 6 is a schematic view of the communication device database of FIG. 3;

FIG. 7 is a schematic view of the slot machine database of FIG. 3;

FIGS. 8A and 8B show an overall flow diagram of the operation of the system of FIG. 1; and

FIG. 9 is a flow diagram of the system of FIG. 1, illustrating termination of automated play.

### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Various embodiments of the present invention provide a method and apparatus for automated play which permits a casino to recognize substantially increased play time, and hence revenue, from a gaming device. At the same time, these various embodiments satisfy a player's emotional desire to maximize his playing time on a gaming device or devices, while accommodating the physical need to at times be away from the machines.

Various embodiments of the present invention include a gaming device operable to receive a limiting criterion of play, initiate automated play of a gaming device, and terminate automated play of the gaming device upon occurrence of the limiting criterion. In another embodiment of the present invention, the automated play of the gaming device includes repetitive play of the device.

In many instances, the limiting criteria will be the use of the moneys initially authorized for play—i.e., a gaming device, operating in the automated play mode, runs out of money. The present invention further provides a method and apparatus for notifying a player when available credit is running low, permitting a player to visit and place more money in a machine, or to remotely authorize further funds for continued play.

A method according to other various embodiments of the present invention includes the steps of communicating a player parameter selection to a gaming device and initiating automated play of the gaming device. In such embodiments, automated play of the gaming device occurs when the gaming device is unattended by a player.

According to other various embodiments, the method includes the steps of receiving a play option and automatically playing a gaming device according to the play option.

The present invention also includes a gaming device which includes a memory device having a player parameter selection stored therein and a processor in communication with the memory device. The processor is configured to initiate automated play of the gaming device until occurrence of a limiting criterion of play.

Various embodiments of the present invention provide for a slot machine operable to: receive a command to start a game, in which the command is a signal that does not correspond to a manually initiated play; play a game in response to receiving the command; and transmit outcome data corresponding to the game.

Other various embodiments of the present invention receive a request for an automated session, in which the automated session comprises a plurality of games; initiate a first game of the automated session, the first game corresponding to a first gaming device; and initiate a second game of the automated session, the second game corresponding to a second gaming device.

Various embodiments of the present invention provide for receiving outcome data from a plurality of gaming devices and determining which outcomes to include in the player's automated play session based on the player's selection parameters for the automated play session.

Various embodiments of the present invention provide for allowing a player of an automated play session to switch automated play from one gaming device to another during an automated play session. Other various embodiments provide for initiating a game of an automated session at a gaming device that is different from the gaming device into which the player entered an amount of funds for the automated play session.

Various embodiments of the present invention provide for determining an outcome of an automated play session that requires a decision by the player in order to determine a further outcome or a payout and then holding the outcome for a later decision by the player.

Various embodiments of the present invention provide for determining a player associated with an automated play session, selecting a gaming device, and providing the player with an offer of a reward in exchange for the player receiving a payout of the automated play session at the selected gaming device.

Various embodiments of the present invention provide for determining a player and providing to the player an offer of a reward in exchange for the player playing an automated play session.

Various embodiments of the present invention provide for allowing an automated play session to be based on at least one outcome of manual play at a gaming device. A method is thus provided for receiving first outcome data associated with a game initiated by a first player at a gaming device, determining an automated play session associated with a second player, and determining second outcome data for the automated play session based on the first outcome data and a session parameter of the automated play session.

Various embodiments of the present invention provide for maintaining an audit trail for a gaming device and the outcomes of a gaming device whereby the gaming device may be used to provide games to an automated play session of a remote player (or players) while a player at the gaming device may also play the gaming device.

The present invention is directed generally to automated play of a gaming device or devices. In various embodiments, a player enters player identifying information and player parameter selections at a gaming device. The gaming device stores the player parameter selections and proceeds to initiate automated play of the gaming device or of multiple gaming devices.

Such automated play may occur while the gaming device is unattended by the player. In various embodiments, the gaming device is locked-up such that no other player may use the gaming device during automated play. In various other embodiments, the gaming device is not locked-up, allowing a player to play the gaming device even while the gaming device is involved in automated play for a remote player. In this manner, the casino may benefit from increased usage of the gaming device.

Remote communications with the player permit the player engaged in automated play both to enjoy the ongoing play, and to alter any pre-established, limiting criteria, for example relating to finding, by making appropriate adjustments during the course of automated play. In various embodiments of the present invention, such adjustments may be made at a gaming device. In other various embodiments, such adjustments may be made via a communication device. Some limitations may also be altered remotely, through a telephone call or appropriate communication to casino personnel. The automated play session ends upon occurrence of a limiting criterion or upon the manual termination of the automated play session by the player.

Certain preferred embodiments of the present invention will now be described in greater detail with reference to the drawings. Although the embodiments discussed herein are directed to reel slot machines, it should be understood that the present invention is equally applicable to other gaming devices, such as video poker machines, video blackjack machines, or the like.

With reference to FIG. 1, a system 1 according to one embodiment of the present invention is shown. In general, the system 1 comprises multiple slot machines 2, a slot network server 4, and a player communication device 6, such as a pager, handheld display device, set-top display device, or cellular telephone. In the present embodiment, each slot machine 2, which is uniquely identified by a machine identification (ID) number, communicates with the slot network server 4 via a slot network 3. The slot network 3 is preferably a conventional local area network controlled by the server 4. It is to be understood, however, that other arrangements in which the slot machines 2 communicate with the server 4 are within the scope of the present invention.

As will be described in greater detail below, the slot machine 2 communicates player identifying information and player parameter selections to the slot network server 4. The slot network server 4, in turn, may communicate locking data to the slot machine 2. Additionally, the slot machine 2 generates machine messages and outcome data. The slot machine 2 communicates the machine messages and outcome data to the slot network server 4, which, in turn, communicates the information to the player communication device (or communication devices) 6. Communication device 6, for example, a pager including a display, provides sufficient information to permit the player to follow and enjoy the play, and in some cases to authorize necessary or desired changes in the play.

With reference to FIG. 2, the slot machine 2 will now be described in greater detail. The slot machine 2 contains a Central Processing Unit (CPU) 210, a clock 212, and an operating system 214 (typically stored in memory as software). The CPU 210 executes instructions of a program stored in Read Only Memory (ROM) 220 for playing the slot machine 2. The Random Access Memory (RAM) 230 temporarily stores information passed to it by the CPU 210 during play. Also in communication with the CPU 210 is a Random Number Generator (RNG) 240.

With respect to gaming operations, the slot machine 2 may operate in a conventional manner. The player may start the machine 2 by inserting a coin, or using electronic credit, and pressing the starting controller 250. Under control of a program stored, for example in a storage device 280 or ROM 220, the CPU 210 initiates the RNG 240 to generate a random number. Alternatively, the CPU 210 may be controlled by, or response to, for example, a stored program or a signal from the slot network server 4. In such a situation, the CPU 210 would initiate the RNG 240 to generate a random number at a time other than in response to an attending player pressing the starting controller 250.

The CPU 210 looks up the generated random number in a stored probability table 282 and finds the corresponding outcome. Based on the identified outcome, the CPU 210 locates the appropriate payout in a stored payout table 284. The CPU 210 also directs a reel controller 260 to spin reels 262, 264, 266 and to stop them at a point when they display a combination of symbols corresponding to the selected payout and/or identified outcome. When the player wins, the machine stores the credits in RAM 230 and displays them in video display area 270.

A hopper controller 290 is connected to a hopper 292 for dispensing coins. When the player requests to cash out by pushing a button on the slot machine 2, the CPU 210 checks the RAM 230 to see if the player has any credit and, if so, signals the hopper controller 290 to release an appropriate number of coins into a payout tray (not shown).

In alternative embodiments, the slot machine 2 does not include the reel controller 260 and reels 262, 264, 266. Instead, a video display area 270 graphically displays representations of objects contained in the selected game, such as graphical reels or playing cards. These representations are preferably animated to display playing of the selected game.

Also in communication with the CPU 210 is a player tracking device 300. The tracking device 300 may comprise a card reader 310 for reading player identification information stored on, or otherwise indicated by, player tracking card 312. As used herein, the term player identifying information denotes any information or compilation of information that uniquely identifies a player. In the present embodiment, the identifying information is a player identification (ID) number and player name. Although not so limited, the player tracking card 312 of the present embodiment stores the player ID and player name on a magnetic strip located thereon. Such a magnetic strip and device to read the information stored on the magnetic strip are well-known.

The player tracking device 300 also includes a display 320, having a touch screen, or a keypad 330. In operation, as discussed below, the slot machine 2 may display a message prompting the player to enter player parameter selections. In the present embodiment, a player enters the player parameter selections via the display 320 which includes a touch screen. In an alternative embodiment, the player enters the player parameter selections via a keypad 330, which is part of the tracking device 300 and, therefore, in communication with the CPU 210.

Also connected to the CPU 210 is a slot network server interface 340. The slot network server interface 340 provides a communication path between the slot machine 2, the slot network 3, and the slot network server 4. Thus, as discussed in greater detail below, information may be communicated among the player tracking card 312, player tracking device 300, slot machine 2, and slot network server 4.

In alternative embodiments, the slot machine 2 may contain the communication device 6, which may be detached from the slot machine 2 for remote play. The player may be required to swipe a credit card, provide a credit card number, or to put up a deposit before detaching the communication device 6.

With reference to FIG. 3, the slot network server 4 will be described in greater detail. Like the slot machine 2 of FIG. 2, the slot network server 4 has a Central Processing Unit (CPU) 410. The CPU 410, which has a clock 412 associated therewith, executes instructions of a program stored in Read Only Memory (ROM) 420. During execution of the program instructions, the CPU 410 temporarily stores information in the Random Access Memory (RAM) 430.

Additionally, the CPU 410 is coupled to a data storage device 440, having a transaction processor 442, a casino player database 444, an automated session database 446, a communication device database 448, and a slot machine database 449. In general, the transaction processor 442 manages the contents of the data storage devices 440. As discussed in detail below, the player database 444, automated session database 446, the communication device database 448, and slot machine database 449 store information related to player identification, automated operation of the slot machine 2, remote communication to the player's communication device 6, and slot machine outcomes, respectively.

In order to communicate with the communication device 6, the slot network server 4 also includes a communication

port 450. The communication port 450 is coupled to both the CPU 410 and the data storage device 440. Thus, the CPU 410 can control the communication port 450 to receive information from the data storage device 440 and transmit the information to the communication device 6. Note that the communication path between the communication port 450 and the communication device 6 need not be hardwired. As noted above, the communication device 6 is preferably a pager, a handheld device including a display (e.g., such as a PDA), or a cellular telephone, and preferably employs wireless communication.

Lastly, the slot network server 4 includes a slot machine interface 460 coupled to the CPU 410. The slot machine interface 460 allows the slot network server 4 to communicate with the slot machines 2 coupled to the network.

The player database 444 of the present embodiment as shown in FIG. 4, includes multiple records having multiple fields of information. Specifically, the player database 444 comprises multiple records, each record being associated with a particular player, as identified by a player identification (ID) code. The fields within each record include: name 4440, social security number 4441, player ID 4442, address 4443, telephone number 4444, credit card number 4445, credit balance 4446, complimentary information, such as complimentary points awarded 4447, hotel room number 4448, and player status rating 4449. Thus, having information related to one field, such as player ID 4442, allows the slot network server 4 to retrieve or access further information stored in the other fields of that player's record.

It is to be understood that not all of these identifying fields, nor the illustrated design of the player database 444, are necessary for operation of the present embodiment. Specifically, the name 4440, social security number 4441, player ID 4442, address 4443, telephone number 4444, credit card number 4445, and hotel room 4448 fields are merely representative of additional information that may be stored and used for other purposes. For example, in an alternative embodiment, credit card number 4445 and hotel room number 4448 are used for billing purposes and social security number 4441 is used to generate tax forms when a player wins a jackpot over a given amount.

Complimentary points awarded 4447 and player status rating 4449 are further illustrative of additional information a casino may store in a player's record. Thus, in the present embodiment, only the player's name 4440, player ID 4442, and credit balance 4446 are necessary.

The automated session database 446, as shown in FIG. 5, comprises multiple records, each record pertaining to an automated play session of a particular player, as identified by the player ID. Consequently, one field in each record is the player ID field 4460. Other fields include: machine identification (ID) number(s) 4461, start time 4462, end time 4463, maximum number of pulls 4464, limiting credit balance 4465, limiting maximum payout 4466, bet per pull 4467, time between pulls 4468, and communication device number 4469. As will be apparent to one of ordinary skill in the art, since both the player database 444 and the automated session database 446 include a player ID field, 4440 and 4460, respectively, the system 1 can correlate any information stored in the player database 444, corresponding to a particular player, with any information stored in the automated session database 446, corresponding to that same player.

The communication device database 448, as shown in FIG. 6, includes multiple records, each record pertaining to a different communication device 6 as identified by a com-

munication device number as stored in the communication device number field 4480. The additional fields in each record include: communicator identifier 4481, player ID 4482, communicator time out 4483, and communicator time in 4484. Because the communication device database 448 and the automated session database 446 both include a communication device number field 4481, 4469, respectively, information can be correlated between the two databases. Furthermore, because the communication device database 448, like the automated session database 446 and the player database 444, contains a player ID field 4482, the system 1 can correlate information contained within these three databases 444, 446, 448 for a particular player, as identified by the player ID.

In one embodiment of the present invention, the information stored in the communication device database 448 is used to inventory the communication devices 6. The communication time out 4483 represents the time at which a player removed a communication device 6 from a slot machine 2 and the communicator time in 4484 represents the time the communication device 6 was returned to the slot machine 2. Having such information, the slot network server 4 may, at any given time, search the communication device database 448 and determine which communication devices 6 are presently in use. Furthermore, for any communication device 6 that has been out for more than a given period, the server 4 may determine which player, based upon the player ID number in field 4482, last used the device 6. Moreover, based on the player ID number, the server 4 can obtain the information necessary to contact that player from that player's record in the player database 444.

As will be understood by those skilled in the art, the ultimate goal of most slot machine players is to hit a jackpot payout. The enjoyment of the play, as well as the ability to maximize the chance of hitting a large jackpot, is increased by more play. Play can be increased both by playing longer, and by playing faster. As will be appreciated from a consideration of the process described below, the present invention permits both increased duration and speed of play.

The slot machine database 449, as shown in FIG. 7, relates to information concerning each slot machine 2. As illustrated, each slot machine 2 has an associated record in the database. Each slot machine 2 is identified by a unique machine ID number, as stored in the machine ID number field 4491. The other fields in the slot machine database 449 include: machine type 4492, machine denomination 4493, maximum coins allowed 4494, payout structure 4495, reel positions 4496, and payout 4497. Because the slot network server 4 may search any field in the slot machine database 449, the server 4 is able to identify a slot machine 2, not only by its machine ID number 4491, but also by the type 4492 and denomination 4493 of the slot machine 2.

Having thus described the components of the present embodiment, the operation of the system 1 will now be described in greater detail with reference to FIGS. 8A and 8B, and continuing reference to FIGS. 1-7. It is to be understood that the programs stored in ROM 420 of the slot network server 4 and ROM 220 of the slot machine 2 provide the function described below.

As shown at step 510, the slot machine player first inserts the player tracking card 312 into the card reader 310. The card reader 310 then proceeds to read player identifier information from the tracking card 312. The player identifier information, namely the player's name and the player ID, are communicated from the slot machine 2 to the slot server 4. Upon receiving the player identifying information, the



slot network server 4 authenticates the information. This step, depicted as step 520, includes the slot network server 4 searching the player database 444 for a record containing the player name and player ID received in the appropriate field 4440, 4442, respectively. Once the slot network server 4 authenticates the player identifying information, the server 4 transmits a signal to the slot machine 2 acknowledging such authentication.

In step 530, the player chooses to select automated slot machine play. According to various embodiments of the present invention, the player may choose to select automated slot machine play after receiving an offer of a reward in exchange for the player participating in an automated play session. The casino may provide such an offer in order to encourage automated play during nighttime hours when use of the slot machines is lower. Alternatively, the casino may provide such an offer during peak hours so as to free up a machine for other players. Of course, the casino may provide a reward for automated play in order to allow another player to use the slot machine manually, or to increase the number of players playing on the slot machine(s), whether remotely or manually (as discussed further below). A reward might be, for example, a bonus payout, a higher payout schedule, a meal compensation, a gift certificate, free credits, or the like.

The slot machine 2 also prompts the player to enter funds for use during the automated play session. Specifically, as shown in step 540, the player enters coins or bills into the slot machine 2. The slot machine 2 registers the total amount of money deposited by the player. The slot machine 2 then transmits a signal to the slot network server 4 indicating the amount of funds deposited by the player. In response, the slot network server 4 accesses the record in the player database 444 corresponding to the particular player and increments the credit balance field 4446 in accordance with the amount of funds deposited.

In the alternative, gaming credits accumulated during non-automated play of the slot machine 2 may be used to fund the automated play session. The slot machine 2, which locally stores the gaming credits in memory, transmits an indication of the amount of credits to the slot network server 4 for addition to the credit balance 4446.

In yet another alternative embodiment, the player, prior to initiating an automated play session, produces the player tracking card 312 at a slot change booth or casino cage and deposits a certain amount of funds. The casino personnel reads the player ID number from the player's tracking card 312 with a card reader and proceeds to access the record in the player database 444 corresponding to that player ID. The cashier then increments the credit balance field 4446 by the amount of funds just deposited.

In step 550 the remote player enters the player parameter selections. More specifically, the slot network server 4 transmits a signal to the slot machine 2 causing the slot machine 2 to display a prompt on the display 320 requesting that the player enter the player parameter selections. As noted above, the player preferably enters the player parameter selections via the touch screen on the display 320. In an alternative embodiment, the player enters the player parameter selection via keypad 330. In yet another alternative embodiment, the player parameter selections are previously stored in a record in the automated session database 446 as identified by the particular player's player ID in field 4460. Alternatively, the player may enter the player parameter selections via communication device 6.

Player parameter selections include both play options and limiting criteria of play. Play options, as used herein, include

any information used to define automated play. In the present embodiment, play options include the bet per game or handle pull and time between games or handle pulls, as stored in fields 4467 and 4468 of the automated session database 446. Other play options may include, for example, the type(s) of slot machine(s) to be played. For example, a player might request an automated play session including only games played at slot machines which had produced the most (or, alternatively, the fewest) wins in the last hour. Alternatively, the player may wish to define an automated play session that includes only games played by players from a specific geographic area.

A limiting criterion, on the other hand, is any information that may define the beginning or end of an automated play session. In the present embodiment, limiting criteria include: start time, end time, requested number of games or handle pulls, credit balance, total losses, total winnings, and limiting maximum payout. By definition, the expiration of all available credits/funding for playing the machine will, unless other arrangements are made in advance with the casino, constitute a limiting criteria of play. Similarly, the player may define a specific winning credit value as a limiting criteria of play (e.g., stop playing if a credit of one thousand dollars is ever registered).

Once the slot machine 2 receives the player preference selections, the slot machine 2 transmits the information to slot network server 4. The slot network server 4, as shown in step 560, proceeds to store the player parameter selections in the appropriate fields in the automated session database 446.

In addition to storing the player parameter selections, the slot network server 4 assigns an address in RAM 430 to keep current totals of actual limiting values. An actual limiting value is a value that corresponds to a limiting criterion of play. More specifically, an actual limiting value is the actual, current total of a criterion value necessary to determine whether any of the limiting criteria of play have occurred.

Thus, in the present embodiment, the slot network server 4 assigns an address in RAM 430 to store the number of games or handle pulls that actually occur during automated play. Additionally, the server 4 assigns an address in RAM 430 to store the actual amount of losses or winnings during automated play. Both the actual number of handle pulls and the actual amount of winnings or losses may be actual limiting values.

Furthermore, the current credit balance, which is stored in RAM 430, may also be an actual limiting value. As described below with reference to steps 590, 600 and 620, these actual limiting values are updated during automated play and used to determine whether a limiting criterion has occurred.

The server 4 may also assign an address in RAM 430 to store a time value corresponding to the play option of time between handle pulls 4468.

Next, in step 570, the automated play session commences. In one embodiment of the present invention, the commencement of automated play includes the slot network server 4 transmitting locking data to the slot machine 2. The locking data is a signal that prevents the slot machine 2 from accepting coins and entering manual mode. The locking data may also be a signal that prevents a player from pulling a pull handle or otherwise initiating a manual play of the slot machine 2.

Alternatively, locking data may be sent by slot network server 4, in accordance with the player's preferences, to a different slot machine than the slot machine 2 where the

player entered funds and/or session parameters. Locking data may instead be sent by slot network server 4 to more than one slot machine, thereby enabling automated play of multiple locked-up slot machines in one automated session.

The slot network server 4 need not transmit locking data. If so, slot machine 2 is not locked and may be used by any player (including the player for whom automated play has commenced). In this manner, a casino may maximize the use of a particular slot machine (or slot machines).

For example, a typical slot machine 2 is capable of generating random numbers more frequently than a typical player initiates a game at the slot machine 2 (e.g., presses the starting controller 250). Thus, RNG 240 may generate a random number in response to an attending player pressing the starting controller 250 during a manual play, and may also generate a random number for a game of an automated play session while, for example, the spin reels 262, 264, and 266 are spinning for the manual play.

Alternatively, a random number generated by an attending player's manual play of slot machine 250 may be used to determine an outcome and/or a payout of a game of an automated play session. Thus, a single random number may be utilized in determining both an outcome of a game of a remote player's automated play session and an outcome and/or a payout of a game of the attending player. Similarly, a game of an automated play session may utilize the outcome and/or payout of a manually played game.

Thus, according to various embodiments of the present invention, an automated play session may include games played at a single locked-up slot machine, games played at multiple locked-up machines, games played at a slot machine (or slot machines) while the machine is also being manually operated, games played manually at a slot machine (or slot machines), or any combination of the above in accordance with player preferences and/or casino operation preferences.

Automated play may commence in various ways. The server 4 may initiate automated play of the game, as shown in step 580, if the player has entered a start time 4463 as a player parameter selection. Specifically, the slot network server 4 searches the automated session database 446 and compares the time from the clock 412 to the values stored in the start time field 4463 and the end time field 4464. If the internal clock time is equal to or greater than the value stored in the start time field 4463 and less than the value stored in the end time field 4464 (if such a value exists), then the slot network server 4 transmits a signal to the slot machine(s) 2 to initiate play.

Alternatively, the player may choose to begin automated play immediately upon entering the player parameter selections other than a start time 4462.

In step 590, the slot machine 2, having played a game and generated outcome data, as described above with respect to various embodiments, transmits the outcome data to the slot network server 4. Along with the outcome data, the slot machine 2 transmits its machine ID number so that the server 4 can identify from which machine the outcome data came. In various embodiments, multiple slot machines 2 transmit outcome data to the slot network server 2.

Outcome data, as used herein, means any information describing the outcome of a game or handle pull. In the present embodiment, outcome data includes the final position of each reel and the corresponding payout or loss for a given play.

According to various embodiments of the present invention, once the slot network server 4 receives the

outcome data, it updates the player database 444 and the slot machine database 449 in step 600. More specifically, the slot network server 4 accesses the slot machine database 449 and updates the record pertaining to the particular slot machine 2, as identified by its machine ID number 4491. The slot network server 4 also accesses the automated session database 446 to determine the bet per pull 4466 for the particular player. Lastly, the slot network server 4 accesses the player database 444 to update the credit balance field 4446 in the player's record. The credit balance field 4446 is decreased by the bet per pull amount and increased by the payout 4497, if any.

In various embodiments, slot network server 4 stores outcome data in conjunction with information identifying the player associated with the outcome. In an embodiment where one player is playing a gambling session at the same time that another player has initiated an automated session at the same slot machine 2, each outcome stored may indicate both players (e.g. by player tracking card number). This allows subsequent audits to account for the fact that although one outcome was generated a corresponding revenue stream may be associated with two players. Alternatively, slot network server 4 may store the above information without the identities.

Once the slot network server 4 receives the outcome data, the server 4 also updates the actual limiting criteria stored in RAM 430, as needed. Specifically, the number of pulls value is incremented by one and the total losses/winnings value is changed to reflect the results of the last game.

In various embodiments of the present invention, the server 4 also stores the time it proceeds to step 610, as indicated by clock 412, as the time value corresponding to the time between handle pulls 4468. The server 4 uses this time value to determine the speed of play. Each subsequent time the system 1 performs the operations of step 600, the server 4 also determines whether, in light of the time between handle pulls 4468, it must delay before continuing to proceed. Specifically, the server 4 retrieves the time between handle pulls 4468 and the previously stored time value. The server only proceeds to step 610 when the current time, as indicated by the clock 412, equals the sum of the time between handle pulls 4468 and the previously stored time value. The server 4 stores the time it proceeds to step 610 as the new time value.

It is anticipated that a player having only a limited time remaining at a casino and a small amount of funds available will enter the minimum allowed time (e.g., "zero") as the time between handle pulls 4468. If such a value is received, the system 1 proceeds to continuously generate outcome data without delay, or with a minimal amount of time between generated outcomes, until a limiting criterion of play occurs. For example, the player enters the minimum allowed time as the time between handle pulls 4468 in step 550 and likely remains at the slot machine 2 to watch the slot machine 2 rapidly play game after game until, for example, the player is out of funds or wins a jackpot.

In various alternative embodiments of the present invention, the slot network server 4 compares received outcome data with a player's session parameters to determine if the game corresponding to the received outcome data should be included as a game in the player's automated play session. For example, a player may choose to include all games from a particular type of slot machine in his automated play session. Thus, when the slot network server 4 receives outcome data corresponding to a game (whether automated or initiated manually) at a slot machine 2, it may

include the game as part of the player's automated play session if the slot machine 2 is of the correct type.

Once the slot network server 4 receives the outcome data and updates the database, the server 4 transmits the results of the play to the remote player communication device 6. The results communicated in step 610 to the player communication device 6 may include the actual reel position 4496, the payout of a particular game 4496, the player's current credit balance 4446, and any other information stored or generated by the system 1.

Alternatively, the results may be stored by the server 4 and communicated, for example, at a specific time, periodically, upon the player's request, or in accordance with a player's selection parameters. Similarly, the results, once received by the communication device 6, may be stored and displayed, for example, at a specific time, periodically, upon the player's request, or in accordance with a player's selection parameters.

The slot network server 4 establishes communication with a communication device 6 that is associated with the particular player. Specifically, the server 4 accesses the communication device database 448 and searches for the communication device number 4480 equal to that stored in the player's record in the automated session database 446 in field 4469. The server 4 then uses the communication identifier 4481, which is the pager or cellular telephone number, or the internet protocol (IP) address of a set-top device, to establish communication with the communication device 6.

Note that in various embodiments, more than one communication device 6 may be associated with the particular player. Thus, results may be transmitted to a player's cellular telephone, PDA, pager, and/or other devices, for example, on a player's "buddy list".

As described above, in one embodiment of the invention communication device 6 comprises a pager with a liquid crystal or other type of display. This communication of the outcome data to the player, which may even include a display of the reel position outcome on the display, permits a player to enjoy the excitement of the play without a physical presence at the device. Further, such essentially real-time communication with the slot machine permits a player to adjust the limiting criteria to maximize enjoyment and potential return, typically by increasing the speed and duration of play.

In one aspect of the invention, the remaining credit balance is communicated to the player along with the outcome data. Thus, when a player notes that his play may be terminated because his credit balance is running out, he has the opportunity to increase the credit balance. Preferably, the player will return to a slot machine and add further moneys. If returning to a slot machine is not convenient, the player can increase the credit balance by phoning the casino and authorizing the casino personnel to increase the credit balance. The casino personnel will appropriately enter the additional funds into the correct server database fields. If returning to a slot machine is convenient, the player may choose simply to return to the machine and add more coins. Alternatively, the player may increase the credit balance by sending a command to the casino, the slot machine 2, the server 4, or other device, via, e.g., a two-way pager or touch-tone wireless telephone.

In step 620, having just completed one play, the slot network server 4 determines whether a limiting criterion has occurred. Specifically, in the present embodiment, the slot network server 4 accesses the record in the automated

session database 446, as identified by the player's ID 4460, to determine whether any one of the limiting criteria have occurred.

The determination of whether any of the limiting criteria have occurred may be made by various comparisons, for example, by comparing any of: 1) the end time 4464 to an internal clock of the server 4; 2) the maximum number of pulls 4464 to the actual number of pulls stored in RAM 430; 3) the current credit balance 4446 to the limiting credit balance 4465; and 4) the limiting maximum payout 4466 to the actual payout 4497. If none of the limiting criteria have occurred, operation of the system 1 proceeds from step 580, once again.

If any one of the limiting criteria has occurred, then, in step 630, the slot network server 4 stops the automated play session and transmits a signal to the communication device 6, thereby notifying the player that the automated session has ended. If the slot machine 2 was locked-up during the automated session, it may remain locked-up until the player returns. In an alternative embodiment, the slot network server 4 also transmits an unlocking signal to the slot machine 2 upon the occurrence of a limiting criterion of play. The unlocking signal indicates to the slot machine 2 that it may accept coins and allow other players to commence play.

In yet another embodiment, information other than outcome data, such as machine messages, is communicated to the communication device 6. Machine messages, as used herein, include information generated by the slot machine 2 relating to the status of that particular slot machine 2. For example, such a machine message may indicate that the slot machine 2 has stopped functioning properly, is being played manually, or is being played automatically by another player.

In yet another embodiment of the present invention, limiting criteria of play, actual limiting values, or both, are communicated to the player. For example, the player will be notified of the current credit balance 4446 and the limiting credit balance 4465, as well as the current number of pulls, as stored in RAM 430, and the maximum number of pulls 4464 allowed.

In an alternative embodiment, the outcome data transferred in step 590 of FIG. 8 need only include the payout 4497, if any. In such an alternative embodiment, the slot machine 2 communicates only the payout information to the slot network server 4. The server 4, in turn, accesses a slot machine database 449 and, based upon the machine ID number transmitted, accesses a record for that slot machine 2. A payout structure for that particular slot machine 2 is maintained within the record. The payout structure, like the payout table 284 in the slot machine 2, correlates the payout received from slot machine 2 to a possible reel result.

For example, if reels 262, 264, 266 of the slot machine 2 reveal "cherry-cherry-bar," the slot machine 2 may determine that, according to the payout table 284, the player should receive a payout of ten coins. The slot machine 2 then communicates to the slot server 4 a payout of ten coins. The server 4, by accessing the payout structure, correlates the payout of ten coins back into the reel positions of "cherry-cherry-bar." Because several reel positions may correspond to the same payout, the slot network server 4 may determine that a reel position other than "cherry-cherry-bar" occurred. Thus, the server 4 simulates the actual outcome of the slot machine 2 for transmission to the player's communication device 6.

It will be appreciated by those skilled in the art that, while the player may select player parameter selections in the

manner described above, the casino may also set guidelines on the automated operation of the slot machines. In general, the casino is desirous of maximizing play on, and hence revenue from, each machine. Thus the casino may limit the selectable range of player parameter selections, for example the frequency of handle pulls, to insure reasonably constant and speedy play. Further, the casino may alter the range of player parameter selections, and even the fundamental operation of the machines, to encourage play during times when the machine is otherwise underutilized. For example, the casino may permit a machine to be played during late night hours, in an automated mode, at a slower speed and with a higher payout schedule. This would permit a player to start automated play during the nighttime hours when the machine would be otherwise unused. The casino hours would benefit from increased play and revenue, while the player would benefit from potentially better payouts.

At any time during the operation of the system 1, as described with reference to FIG. 8, the player may return to the slot machine 2 and manually terminate automated play. Such manual termination of automated play will now be described with reference to FIG. 9.

Upon returning to the machine 2, as shown in step 710, the player, in step 720, inserts the player tracking card 312 into the card reader 310. The card reader 310 reads the player identifying information from the player tracking card 312 and, in step 730, the slot machine 2 transmits this player identifying information to the slot network server 4.

In step 740, the slot network server authenticates the player identifying information. Specifically, the slot network server 2 searches the automated session database 446 to determine whether the player ID number and the machine ID number just received are also present in a single record in the automated session database 446. If the information is present in a single record in the automated session database 446, the player identifying information is deemed authentic.

In an alternative embodiment, the player may terminate his automated play session by returning to any available slot machine 2, regardless of whether the slot machine 2 was involved in the automated play session. Accordingly, the player identifying information may be deemed authentic if the player ID number is in at least one record in the automated session database 446.

Having authenticated the player identifying information, the slot network server 4 transmits the results from the automated play to the slot machine 2 for display to the player in step 750. The results, which are displayed on display 320 or, alternatively, video display area 270, preferably include the player's credit balance 4464. The displaying of the results may also include, for example, all of the resulting reel positions or only the winning reel positions. These results may also be made available to the player via the communication device 6. Having read the results from the automated play session, as shown in step 760, the player may then decide to terminate play. In step 770, if the player decides to terminate play, then the player may receive a payout owed.

It will be understood that, should the player so desire, a complete audit of the automated play session is available through an appropriate examination of the contents of slot machine database 449. Such an audit would typically be provided by casino personnel upon special request by the player, and could include a complete reporting of results for every play during the automated session.

On the other hand, if the player decides not to terminate play, then the player must decide whether to resume auto-

ated play, as shown in step 780. If the player decides to resume automated play, such play will continue as described with reference to FIG. 8, steps 580-630, until a limiting criterion occurs or the player returns to manually terminate play. The resumption of automated play is shown as step 790.

As an alternative to resuming automated play, the player may decide instead to resume manual play of the slot machine 2. Step 800 illustrates the resumption of manual play.

As shown in step 770, the player may receive any payout 4497 due. Receiving the payout may involve the slot machine 2 dispensing the amount of coins equal to the credit balance 4464 for the player. Note that the slot machine 2 may or may not be the same slot machine at which the player initiated his automated play session. In an alternative embodiment, the payout involves the player returning to the slot change booth or casino cage and presenting the player tracking card 312. The casino personnel proceed to read the player ID and player name from a player tracking card 312. Upon verifying the player's identification with a secondary form of ID, such as a driver's license, the personnel access the player database 444. The casino personnel proceed to pay the player any amount less than or equal to the current credit balance 4446 stored in the player's record. The personnel then adjust the credit balance 4446 to reflect the disbursement.

In another alternative embodiment, the player may receive a prize or reward in lieu of the payout 4497 due. For example, the casino may offer the player a free hotel stay in lieu of the payout 4497 due. Such an offer may be communicated to the player, for example, by the casino personnel, via the communication device 6, or via the display 320 of the slot machine 2. Of course, such an offer may be communicated via the communication device 6 during automated play.

It is to be understood that the present invention is not limited to an embodiment including both the slot machine 2 and the slot network server 4. Specifically, in one embodiment of the present invention, a slot machine alone stores the automated play information, including player identifying information, credit balance, player parameter selections, and actual limiting values. Moreover, the slot machine not only generates outcome data, but also, rather than employing a server, internally updates the information as described above.

Furthermore, the present invention encompasses automated play of gaming devices that require a player to make decisions during play, such as video blackjack machines, video poker machines, and the like. The inclusion of decision rules in the player parameter selections accounts for the need to make decisions. Alternatively, decision rules may be applied to all players or may be otherwise outside of the control of the player. For example, all players playing an automated play session, or a certain subset of such players, may be forced to play according to a predetermined set of decision rules. Decision rules dictate the course of play based upon the current status of play. For example, decision rules for automated play of a video blackjack machine include staying when the dealer shows a "six" and playing according to the highest odds of winning. In short, because decision rules obviate the need for player decisions, automated play may proceed.

In an alternative embodiment, outcomes requiring a decision by the player may be stored and displayed to the player at a later time, for example, when the player returns to the

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slot machine 2, or via the communication device 6 at the player's request. After the outcome requiring a decision is stored, automated play may then continue with the next game. For example, some outcomes of reel slot machine games require the player to make a selection in a bonus round. In accordance with this alternative embodiment, then, automated play could continue without the player's selection. The player could then play all the stored bonus round outcomes requiring the player's selection at a later time.

There has thus been provided a method and apparatus of operating a gaming device, for example a slot machine, in an automated manner. The present invention permits a casino to significantly increase the usage and revenue of such gaming devices, encouraging substantially continuous play at times when the machine might otherwise be un- or under-used. The invention further permits a player to enjoy all of the benefits of gambling, such as the enjoyment of viewing real-time gaming device results, without necessitating a physical presence at the machine. Additionally, the invention permits the casino to offer better-than-normal playing parameters, such as an improved payout schedule, or even the special reservation of a selected machine during normal playing hours.

Although the present invention has been described in terms of certain preferred embodiments, other embodiments that are apparent to those of ordinary skill in the art are also intended to be within the scope of the present invention. Accordingly, the scope of the present invention is intended to be limited only by the claims appended hereto.

What is claimed is:

1. A method comprising:

receiving first outcome data representative of at least one game at a game device in, which the at least one game at the game device is initiated by a first player;

determining an automated session associated with a second player; in which the automated session comprises at least one game that is not initiated by the second player;

determining at least one session parameter corresponding to the automated session; and

determining second outcome data based on the at least one session parameter and the first outcome data.

2. The method of claim 1, in which the at least one game at the game device is initiated by a handle pull.

3. The method of claim 1, in which the game device is a slot machine.

4. The method of claim 1, in which the game device is a video poker machine.

5. The method of claim 1, in which the at least one session parameter comprises at least one of:

- a bet amount,
- a type of game,
- a period of time between games,
- a start time,
- an end time,
- a number of games,
- the credit balance,
- a number of losses,
- a number of wins,
- an amount lost,
- an amount won,
- a number of plays without a win,
- a number of plays without a loss,
- a rate of loss, and
- a rate of winning.

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6. The method of claim 1, further comprising:

transmitting at least a portion of the second outcome data to the second player.

7. The method of claim 6, in which the second player is remote from the game device.

8. The method of claim 1, further comprising:

transmitting at least a portion of the second outcome data to a communication device.

9. The method of claim 8, in which the communication device is remote from the game device.

10. The method of claim 8, in which the communication device is associated with the second player.

11. The method of claim 8, in which the communication device comprises a pager.

12. The method of claim 8, in which the communication device comprises a handheld device.

13. The method of claim 8, in which the communication device comprises a telephone.

14. The method of claim 8, in which the communication device comprises a personal digital assistant.

15. The method of claim 8, in which the communication device is associated with an internet protocol address.

16. The method of claim 8, in which transmitting the at least a portion of the second outcome data comprises;

transmitting the at least a portion of the second outcome data to the communication device via wireless communication.

17. The method of claim 1, in which determining the second outcome data comprises:

determining the second outcome data at a remote communication device that is associated with the second player.

18. The method of claim 1, in which receiving the first outcome data comprises:

receiving the first outcome data at a remote communication device that is associated with the second player.

19. A method comprising:

initiating a game at a game device;

receiving game data corresponding to the game initiated at the game device;

determining first session parameters corresponding to a first automated session, in which the first automated session comprises at least the game initiated at the game device, and in which the first automated session is associated with a first player;

determining second session parameters corresponding to a second automated session, in which the second automated session comprises at least the game initiated at the game device, and in which the second automated session is associated with a second player;

determining first outcome data based on the first session parameters and the game data; and

determining second outcome data based on the second session parameters and the game data.

20. The method of claim 19, in which the first session parameters comprise at least one of:

- a bet amount,
- a type of game,
- a period of time between games,
- a start time,
- an end time,
- a number of games,
- the credit balance,

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a number of losses,  
 a number of wins,  
 an amount lost,  
 an amount won,  
 a number of plays without a win,  
 a number of plays without a loss,  
 a rate of loss, and  
 a rate of winning.

21. The method of claim 19, further comprising:  
 transmitting at least a portion of the first outcome data to  
 the first player.

22. The method of claim 21, in which the first player is  
 remote from the game device.

23. The method of claim 19, in which initiating the game  
 comprises:  
   transmitting a signal to the game device, the signal being  
   instructive to generate an outcome at the game device.

24. The method of claim 19, further comprising:  
   transmitting at least a portion of the first outcome data to  
   a communication device.

25. The method of claim 24, in which the communication  
 device is remote from the game device.

26. The method of claim 24, in which the communication  
 device is associated with the first player.

27. The method of claim 24, in which the communication  
 device comprises a pager.

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28. The method of claim 24, in which the communication  
 device comprises a handheld device.

29. The method of claim 24, in which the communication  
 device comprises a telephone.

30. The method of claim 24, in which the communication  
 device comprises a personal digital assistant.

31. The method of claim 24, in which the communication  
 device is associated with an internet protocol address.

32. The method of claim 24, in which transmitting the at  
 least a portion of the first outcome data comprises:  
   transmitting the at least a portion of the first outcome data  
   to the communication device via wireless communica-  
   tion.

33. The method of claim 19,  
 in which the game data comprises an indication of a  
 payout; and  
 in which determining the first outcome data comprises:  
   determining at least one reel position based on the  
   payout.

34. The method of claim 33, further comprising:  
   transmitting an indication of the at least one reel position  
   to a remote communication device that is associated  
   with the first player.

35. The method of claim 19, further comprising:  
   transmitting locking data to the game device.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT G**



US005265874A

**United States Patent** [19]

[11] Patent Number: 5,265,874

Dickinson et al.

[45] Date of Patent: Nov. 30, 1993

[54] **CASHLESS GAMING APPARATUS AND METHOD**

[75] Inventors: Peter D. Dickinson, Reno; Charles T. Schreiber, Sparks; Logan Pease, Reno, all of Nev.

[73] Assignee: International Game Technology (IGT), Reno, Nev.

[21] Appl. No.: 829,097

[22] Filed: Jan. 31, 1992

[51] Int. Cl.<sup>5</sup> ..... A63F 9/00

[52] U.S. Cl. .... 273/138 A; 364/412

[58] Field of Search ..... 273/138 A, 143, 434; 194/210, 217; 364/412

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Primary Examiner—William H. Grieb

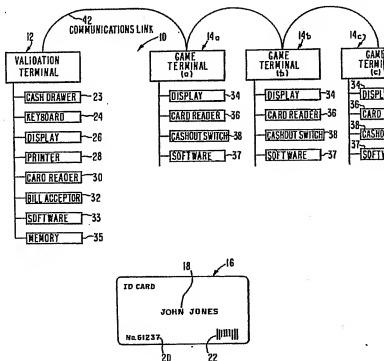
Attorney, Agent, or Firm—Townsend and Townsend Khoure and Crew

[57]

**ABSTRACT**

A cashless gaming apparatus and method suitable for casinos. A player hands over money and an ID card to a clerk at a validation terminal. The clerk stores the ID number and the amount of money in the memory of the validation terminal. Then the clerk returns the ID card to the player for operating any one of a number of game terminals. The player then selects a game terminal which reads the player's ID card, whereupon the cash amount from the validation terminal is downloaded to the selected game terminal and the game terminal can then be played. If the player wishes to play another game terminal, the player actuates a cashout switch on the current terminal. The player then moves to another game terminal and the player's ID card is read into the second game terminal, whereupon the money remaining as a cash amount is downloaded to the second game terminal. The player can then play the second game terminal. When the player wishes to stop play of the game terminals completely, the player actuates the cashout switch of the last game terminal played. The player presents his ID card to the clerk at the validation terminal and the validation terminal reads the ID card. A ticket showing the card number and the cash amount is printed and the player is paid the cash amount on the spot. The printed ticket is then used for reconciliation.

17 Claims, 3 Drawing Sheets





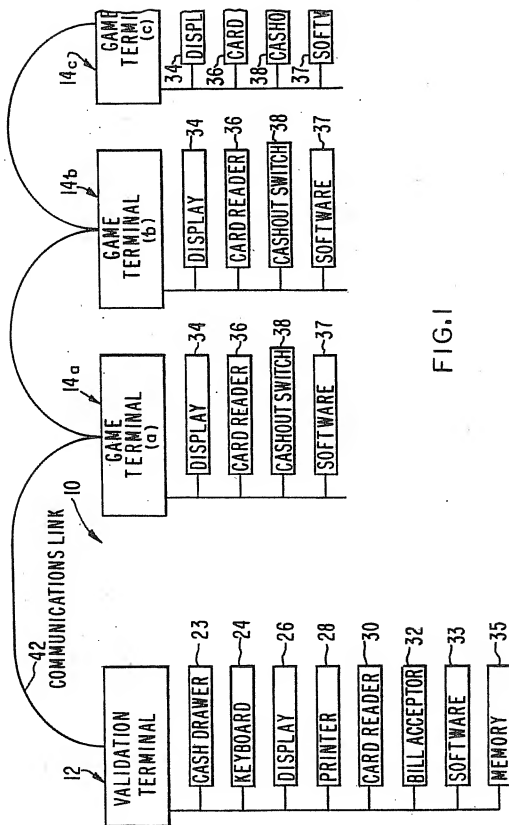


FIG. 1

FIG. 2

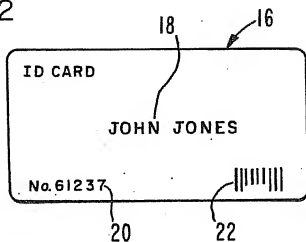


FIG. 3

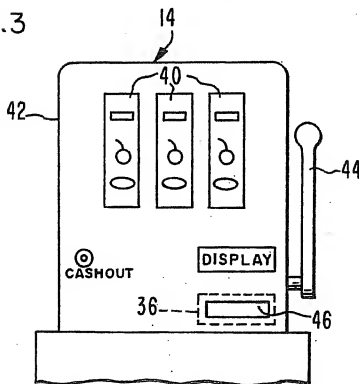
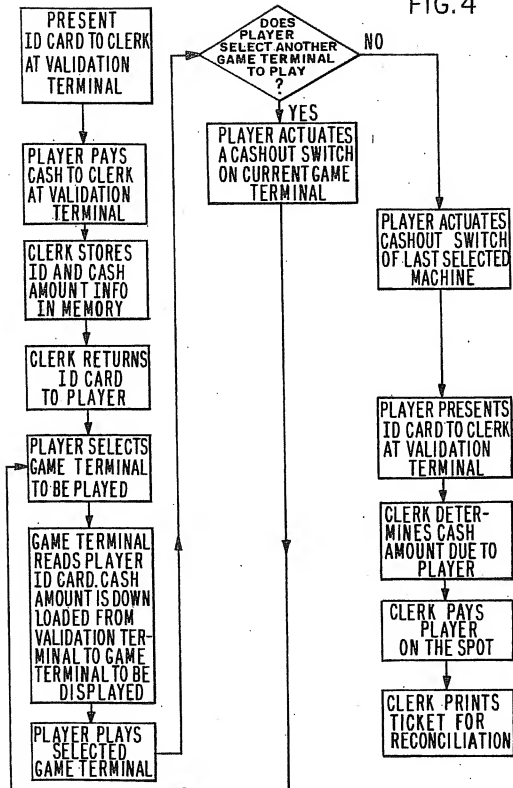


FIG. 4



## CASHLESS GAMING APPARATUS AND METHOD

This invention relates to improvements in the playing of games using coins, chips and other credit items, and, more particularly, to game terminals and a method for playing game terminals at any one of a number of different locations of a gaming establishment without the need for such credit items.

## BACKGROUND OF THE INVENTION

In gaming establishments, such as casinos or the like, a large number of game terminals are placed throughout such an establishment. Players of the game terminals select the game terminal which they wish to play and either obtain coins or chips from a roving change clerk or use the coins or chips or other credit items in their possession at the time they select a game to play.

Typically, a game player obtains additional change for playing games from the roving change clerk, who carries a certain amount of money and makes change on the spot near a game terminal operated by a game player. In the alternative, the game terminal can have a bill acceptor and coin handling means wherein the game player can obtain additional change by operating the bill acceptor so as to avoid having to call on the change clerk to make change for continued play of the game.

The disadvantage of this game playing technique is that, when the game player runs out of change, coins or chips, the player may not be able to continue to play the game terminal for some time, at least for several minutes or more, because the change clerk who makes the change is not immediately available. Moreover, a certain amount of time is required to operate a bill acceptor in that the person must take a bill out of his pocket, place it in the bill acceptor and then scoop up the change from the bill acceptor before depositing the change in the game terminal and continuing to play the game terminal. This stoppage reduces profits in that it reduces the amount of money fed to the game terminal. It also increases game terminal costs which must include a bill acceptor, coin handling means and/or a printer. This additional peripheral costs could run as high as \$1,000 per terminal.

Because of the foregoing drawbacks, a need exists for improvements in apparatus and method for the play of a game or games without the need for cash in the form of coins, chips and other credit items. The present invention satisfies this need.

Disclosures relating to this general subject matter include the following U.S. Patents:

4,689,742	4,669,730	4,575,622
4,675,515	4,815,741	
4,669,596	4,339,798	

## SUMMARY OF THE INVENTION

The present invention is directed to a cashless gaming apparatus and method which is suitable for gaming applications including route operations, gaming devices in casinos and video lottery inventions. This invention eliminates the need for bill acceptors, coin handling equipment and printers at various game terminals of a casino or other gaming establishments, thus saving as much as \$1,000 per game terminal.

The apparatus and method of the present invention operate in such a way that, instead of a player playing

with change, coin, chips or other credit items, the player hands over a certain amount of money to a clerk at a validation terminal. The clerk also takes an ID card from the player and stores the number of the ID card and the cash amount handed over by the player in the memory of the validation terminal. Then the clerk returns the ID card to the player for his use in operating any one of a number of game terminals.

The player then takes the ID card to any game terminal in the casino or gaming establishment. The player's ID card is read by the game terminal card reader of a selected game terminal, whereupon the cash amount at the validation terminal is downloaded and displayed to the player on the selected game terminal. Operation of that game terminal by the player can then begin. The player continues to play the selected game terminal as long as desired or as long as a cash amount remains on the game terminal.

If the player wishes to play a different game terminal, the player actuates a cashout switch on the game terminal currently being played. The game terminal uploads the cash amount balance to the validation terminal. The player then moves to a different game terminal. The player's ID card is read by the new game terminal, whereupon the cash amount balance at the validation terminal is downloaded and displayed to the player on the new game terminal. The player can then play the new game terminal.

Finally, when the player wishes to stop play of the game terminal completely, the player again pushes the cashout switch. The game terminal then uploads the cash amount balance to the validation terminal. The player then takes his ID card to the validation terminal and the clerk at the validation terminal reads the card to obtain the ID information and the cash amount balance therefrom. A ticket showing the ID card number and the cash amount is printed on the validation terminal printer and the player is paid the cash amount on the spot. The printed ticket is then used for reconciliation.

The primary object of the present invention is to provide an improved apparatus and method for playing a game without a need for cash in the form of coin, chips and other credit items, wherein the apparatus and method require only an ID card and a payment of cash to a validation clerk at a central location to allow the holders of the card to play any one of a number of game terminals at any time so long as a positive balance is maintained in the cash amount of the player to thereby avoid the need for coins, chips, change or other credit items which must be fed in series into a game terminal to operate the same.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a validation terminal and one or more game terminals coupled together to form a cashless gaming system for a gaming establishment or the like;

FIG. 2 is a top plan view of one style of ID card used by a player of a game terminal of the system;

FIG. 3 is a front elevational view of a game terminal of the slot machine type; and

FIG. 4 is a flow chart of the operation of the gaming system of FIG. 1.

# DETAILED DESCRIPTION OF THE DRAWINGS

The gaming system of the present invention is broadly denoted by the numeral 10 and is illustrated in block form in FIG. 1. The system 10 is made up of three major entities, namely, a validation terminal 12, one or more game terminals 14, and a player of the gaming system 10, such person being identified by an ID card 16 having certain information on it, such as the bearer's name 18, an ID number 20, and an encoded number (bar code, optical code or magnetic code) 22, if desired or deemed necessary.

The validation terminal includes a cash drawer 23, a keyboard 24, a display 26, a printer 28, a card reader 30 and a bill acceptor 32. All of these components are coupled with the validation terminal 12 and cooperate with each other to carry out the steps of a certain algorithm as outlined in the flow chart of FIG. 4 and which is inherent in software 33 used for programming of the validation terminal.

Each game terminal 14 includes a display 34, an ID card reader 36, a cashout switch 38, software 37 and communication links 42 with interconnect validation terminal 12 and each of the game terminals 14.

Each game terminal 14 can be of any suitable construction. For purposes of illustration, a game terminal 14 is shown in FIG. 3 and is of the slot machine type in which windows 40 are in the front of a housing 42 and the windows permit the viewing of symbols on reels in the housing. The game terminal also has a lever 44 which is manually pushed to actuate the play of the game using the game terminal 14. The various game terminals 14 are at spaced locations in a casino or other gaming establishment.

Each game terminal 14 has a card reader 46 for reading the ID card 16 of a player of the game.

The system is actuated when the player proceeds to the validation terminal which is operated by a clerk. The player presents to the clerk at the validation terminal the cash in the amount that the player would like to play with, such as \$50 or the like. The clerk enters the cash amount paid by the player to the clerk. This is entered by way of the keyboard 24 into the validation terminal. In the alternative method, the player inserts one or more bills into the bill acceptor 32. This cash amount is stored in the memory 35 of validation terminal, and such amount is available to the player for playing any one or more of a number of gaming terminals 14 associated with system 10.

At the validation terminal, the clerk asks the player for an ID card 16. The card is read by the card reader 30 of validation terminal 12. The clerk then returns the ID card to the player who retains possession of the card at all times thereafter. The validation terminal now associates the cash amount entered with the ID card number and stores both the cash amount and the ID card number in the memory 35 of the validation terminal 12.

The player then proceeds to any game terminal 14, such as game terminal 14a, and the game terminal reads the ID card 16 by way of card reader 36. The game terminal software 37 stores the ID card number, and then transmits it to the validation terminal over the communication link 42.

The validation terminal 12 receives the ID card number and retrieves the cash amount associated with the ID card number from its memory. The cash amount

retrieved is then transmitted back to the game terminal over the communication links 42 between the validation terminal 12 and the selected game terminal 14a. The selected game terminal 14a receives the cash amount and shows it in display 34 associated with the game terminal so that the player will know at all times the status of the cash amount. The player can then start the play of the game associated with game terminal 14a.

As the game is progressively played, the cash amount can be used up or supplemented by winnings. At all times, the cash amount of the player is displayed in the corresponding display 34.

If the player wishes to play a different game terminal 14 and has a cash amount remaining on the current game terminal or if the player wishes to redeem a cash balance and leave the casino or establishment having the game terminals 14, the player actuates a cashout switch 38 on the game terminal currently being played. The current game terminal transmits the cash amount along with the ID card number stored in the game terminal to the validation terminal 12 over the communications link 42. The validation terminal 12 receives the cash amount and the ID card number and stores the cash amount associated with the ID card number.

If the player proceeds to a different game terminal 14, the foregoing procedure is followed for the second or new game terminal 14. The player continues to play at the second or new game terminal until the player wishes to cash out or if the player runs out of cash altogether.

If the player wishes to redeem a cash amount, the following step is performed: the player presents the validation clerk with his ID card and asks for a cash out. The ID card received from the player is read by the card reader 30 of the validation terminal 12. The validation terminal 12 checks its memory 35 for the ID card number and any cash amount associated with it. Such amount is displayed on the validation terminal display 26 and printed by printer 28 as a cashout receipt. The clerk plays the player the cash amount displayed on the cashout receipt and returns the ID card to the player. The clerk places the cashout receipt in cash drawer 23 for reconciliation.

The present invention includes a cashless gaming system with distributed data storage which allows for playing of any one of a number of game terminals 14 as selected by the player. Instead of allowing the player to play with coins, chips or the like, the player hands over his money to the validation clerk who inserts the money in the form of bills in the bill acceptor 32 and reads the ID card 16 of the player in the validation terminal 12. The player can then take the ID card 16 to any game terminal 14 and the card reader 36 of the selected game terminal can identify the cash amount to be downloaded into the selected game terminal 14 from the validation terminal 12. Play of the game terminal can thus be initiated and maintained so long as the cash amount is a positive value.

The present invention solves most if not all of the problems currently proposed with conventional gaming methods. The system of the present invention applies to applications ranging from route operations to casinos to video lotteries and would eliminate the need to have a bill acceptor, coin handling or printer at each game terminal, thus saving as much as \$1,000 per terminal.

What is claimed is:

1. Game playing apparatus comprising: a validation terminal having a card reader and a memory; a plurality of game terminals spaced from the

validation terminal; communication means coupling the validation terminal to each game terminal, respectively; a player ID card having identification information thereon, said card adapted to be read by the card reader of the validation terminal and to be coupled to the memory for placing said ID information into memory; means coupled with the validation terminal for providing cash amount data to the memory corresponding to the ID information of the card, said validation terminal through said communication means being operable for enabling each of the game terminals when a positive cash amount is in the validation terminal as cash data associated with a particular ID card of a player, each game terminal having a card reader for reading the ID information from a player card, said card being operable to allow a player to play any of the game terminals so long as a positive cash amount is in the validation terminal, each game terminal having a display showing the current cash amount available to the player, each said game terminal further including a cashout device for allowing the player of a first game terminal to cash out from the first game terminal and to use an ID card to enable a second game terminal for play of a game of the second game terminal, said cashout device further permitting the player to receive the cash amount from the validation terminal upon a decision to withdraw from further play of the game of any of the game terminals.

2. A system as set forth in claim 1, wherein said means for entering the amount in the memory of the validation terminal includes a keyboard.

3. A system as set forth in claim 1, wherein is included a bill acceptor for receiving cash, and means for directing the cash amount from the cash of the validation terminal.

4. A system as set forth in claim 1, wherein said validation terminal has a printer for printing a receipt associated with the cashout payment of the cash amount of a player to the player.

5. A system as set forth in claim 1, wherein said validation terminal has means for positioning a clerk at the validation terminal to receive the cash from a prospective player and to enter the player ID and cash information in memory.

6. A system as set forth in claim 1, wherein said printing means includes a printer for printing a cashout receipt.

7. A system as set forth in claim 1, wherein is included means for programming the validation terminal.

8. A method of playing a game comprising:

providing a plurality of game terminals at spaced locations from a validation terminal having a memory;

paying cash to a clerk at the validation terminal to provide a cash amount to be used in playing the game terminals; storing the ID information of a player and information about the cash amount in memory;

electing a game terminal to be played; downloading the cash amount from the memory of the validation terminal to the selected game terminal to enable operation of the game terminal;

playing the selected game terminal; notifying the validation terminal of the desire to discontinue further play of any game terminal; and paying the cash amount stored in memory to the player who has cashed out.

9. A method as set forth in claim 8, wherein said cashout step includes printing a receipt containing the amount paid to the player with the receipt being used for reconciliation purposes.

10. A method as set forth in claim 8, wherein said read-in of player ID cash and payment information to the clerk includes operating a keyboard.

11. A method as set forth in claim 8, wherein said step of entering the player ID information includes reading an ID card of the player into a card reader of the validation terminal.

12. A method as set forth in claim 11, wherein said reading step includes reading the information from the card as the card is read by the card reader.

13. A method as set forth in claim 8, wherein is included the step of determining whether a second terminal is to be played;

actuating a cashout device if it is determined that a second terminal has been or is to be selected for play;

downloading the ID information and the cash amount remaining to the second game terminal; and

playing the second game terminal.

14. A method as set forth in claim 13, wherein the step of actuating a cashout device includes actuating a switch...

15. A method as set forth in claim 8, wherein the notifying step includes reading an ID card by the card reader of the validation terminal.

16. A method as set forth in claim 8, wherein is included the step of displaying the cash amount to the player of a game terminal.

17. A method as set forth in claim 16, wherein the displaying step includes reading an ID card by the card reader of the game terminal.

\* \* \* \* \*

**EVIDENCE APPENDIX**  
**EXHIBIT H**



US006916244B2

(12) **United States Patent**  
**Gatto et al.**

(10) Patent No.: **US 6,916,244 B2**  
 (45) Date of Patent: **Jul. 12, 2005**

(54) **SERVER-LESS CASHLESS GAMING  
 SYSTEMS AND METHODS**

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(\*) Notice: Subject to any disclaimer, the term of this  
 patent is extended or adjusted under 35  
 U.S.C. 154(b) by 386 days.

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 (74) *Attorney, Agent, or Firm*—Young Law Firm, P.C.

# (57) ABSTRACT

Methods and systems that enable cashless gaming dispense  
 with the need to set up and operate a complex centrally  
 controlled system or dispense with the need to distribute  
 expensive smart cards. The patrons' gaming session meters  
 (including, for example, a measure of winning and/or avail-  
 able credit) are distributed amongst an estate of peer net-  
 worked gaming terminals.

(21) Appl. No.: 10/163,177  
 (22) Filed: Jun. 5, 2002  
 (65) Prior Publication Data  
 US 2003/0228907 A1 Dec. 11, 2003

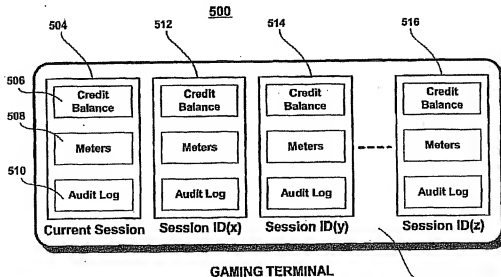
(51) Int. Cl.<sup>7</sup> ..... A63F 13/00  
 (52) U.S. Cl. .... 463/25  
 (58) Field of Search ..... 463/1, 25, 27,  
 463/29, 39, 40, 43

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52 Claims, 5 Drawing Sheets





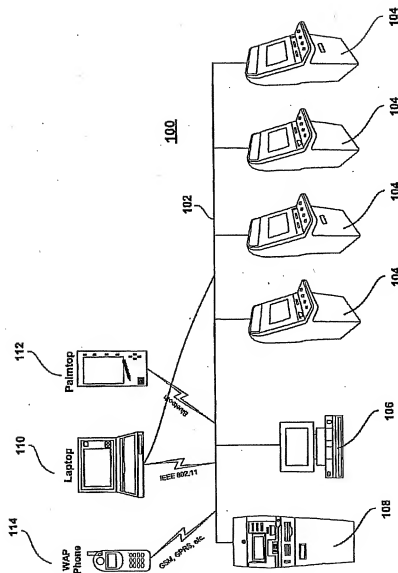


FIG. 1

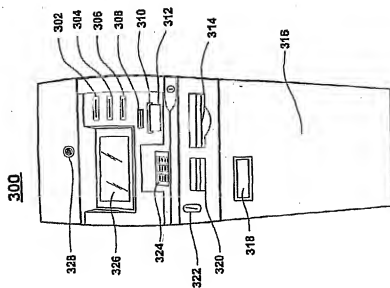


FIG. 3

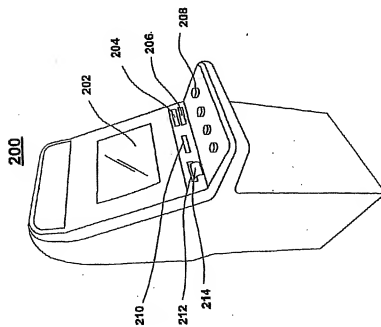


FIG. 2

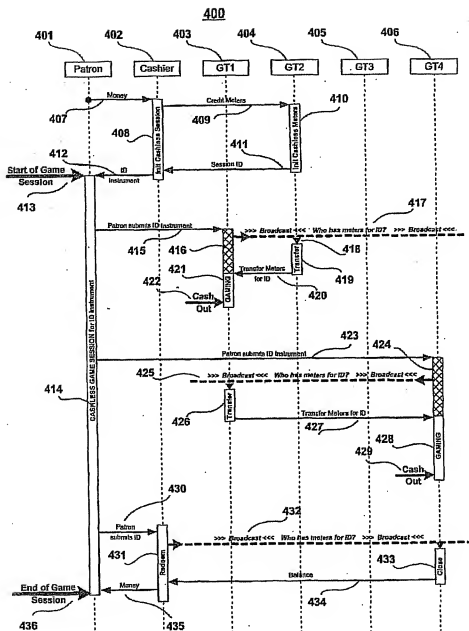
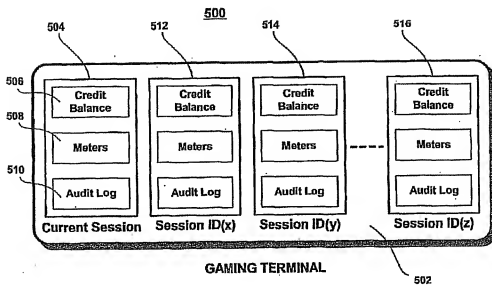
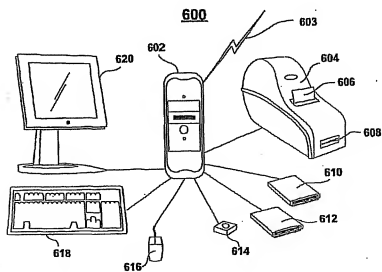


FIG. 4

*FIG. 5**FIG. 6*

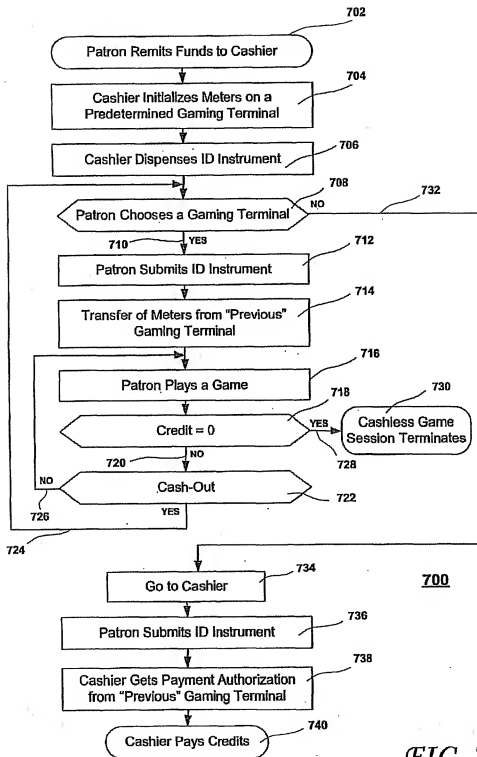


FIG. 7

# SERVER-LESS CASHLESS GAMING SYSTEMS AND METHODS

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates generally to the field of pay computer-controlled games, either games of skills or games of chance, and more particularly to the field of cashless gaming systems and methods.

### 2. Description of the Related Art

Conventional cashless methods and systems typically rely on centralized accounts (player accounts, anonymous game session accounts, voucher verification accounts, smartcard reconciliation accounts) that are managed by a complex central system (i.e., controlled or coupled to a central server). Such systems require the services of highly trained professionals and the maintenance of stringent security procedures. This leads to high operational costs that are not acceptable for small to medium sized gaming operators. Centralized systems of the prior art are described in U.S. Pat. No. 6,280,328, U.S. Pat. No. 5,265,874 and U.S. Pat. No. 6,048,269.

What are needed, therefore, are cashless gaming methods and systems that overcome the complexity, cost and manpower of conventional gaming methods and systems.

## SUMMARY OF THE INVENTION

It is, therefore, an object of this invention to offer gaming terminals and network architectures, systems and methods that overcome the complexity, cost and manpower inherent in conventional gaming terminals, network architectures, methodologies and systems.

According to embodiments of the present invention, each networked gaming terminal comprises a highly secure enclosure because of the strict regulations that are imposed in gaming jurisdictions. The compute modules thereof are carefully partitioned with multiple locking mechanisms and alarm systems. Strict procedures must be followed to access various parts and functions. Furthermore, the computer architecture and components of motherboards used in gaming machines are becoming enormously powerful and extremely reliable due to the technology advancements; they are identical to those used in computer servers that constitute complex central systems. Therefore, networked gaming terminals may offer an exceptionally secure and exceedingly powerful computing environment.

In the present invention, the gaming terminals are advantageously configured to support functions traditionally implemented by centralized systems. Gaming terminal software is adapted to support, in addition to the local terminal game session metering (including, for example, tracking of winning and available credits), the game session metering of one or a plurality of peer gaming terminals. A patron may deposit funds in cash or using any other financial instrument (including, for example, any form of electronic money) to a cashier or an automated network cashier, or alternatively a gaming terminal equipped with cash acceptors or other financial instrument acceptors. According to an embodiment of the present invention, the amount of money deposited by the patron is credited by the cashier, or gaming terminal or using a basic stateless (i.e. not managing the session context) entry terminal, into a peer gaming terminal or alternatively, the equivalent operation may be automatically performed by the automated network cashier. In the case of a gaming

terminal equipped with financial instrument acceptors, the credit is entered directly into the local meters (i.e., not stored in memory prior to being transferred to the local meters of the gaming terminal). The patron may be issued an identification (ID) instrument that may be accepted by any gaming terminal in the network. Each time the patron submits his ID instrument (or is otherwise authenticated) to a new gaming terminal on the network, the new gaming terminal may broadcast a network message to request the previously used gaming terminal to transfer to the new terminal the game session meters corresponding to the ID instrument. That is, the request may be broadcast to all gaming terminals on the network and only the gaming terminal owning the requested game session meters will respond to the broadcast request. Consequently, the patron may play on any gaming terminal within the network and change gaming terminal at any time as long as his game session credit is not exhausted. The transfer of meters preferably occurs directly between the networked gaming terminals, without the intermediary of an intervening terminal or storage.

The patron may redeem his winnings or remaining credits by submitting his ID instrument to an automated cashier, to a cashier equipped with a network entry terminal or to a gaming terminal equipped with a coin dispenser or a bank note dispenser. For the payment operation, payment authorization may be obtained via the network from the last gaming terminal on which the patron last played.

For fault tolerance, each game session meter may be mirrored on one or a plurality of peer gaming terminals on the network.

It is a further object of this invention supports all forms of cashless instruments such as:

- a player account whereby primary meters are the monetary credit balance associated to a patron ID;
- an anonymous game session account whereby primary meters are the monetary credit balance associated to a game session ID;
- a voucher verification account whereby the primary meters are the monetary value and the hash associated to the value amount and the encrypted signature printed or encoded on the voucher;
- a time gaming account whereby the primary meters are the time-to-play balance and the total of the winnings associated to a patron ID or to a game session ID;
- a smartcard reconciliation account whereby the primary meters are a mirrored copy of the meters managed in the secure electronic module of the smartcard.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an overview diagram of an exemplary server-less cashless gaming system, in accordance with an embodiment of the present invention.

FIG. 2 is a view depicting an exemplary cashless game terminal in accordance with an embodiment of the present invention.

FIG. 3 is a view depicting an exemplary automated cashier in accordance with an embodiment of the present invention.

FIG. 4 is a diagram depicting a server-less cashless game session in accordance with an embodiment of the present invention.

FIG. 5 is a diagram depicting the cashless meters in accordance with an embodiment of the present invention.

FIG. 6 is a view depicting an exemplary cashier network entry terminal in accordance with an embodiment of the present invention.

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FIG. 7 is a flowchart depicting the cashless meters in accordance with an embodiment of the present invention.

#### DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the construction and operation of preferred implementations of the present invention illustrated in the accompanying drawings. The following description of the preferred implementations of the present invention is only exemplary of the invention. Indeed, the present invention is not limited to these implementations, but may be realized by other implementations.

FIG. 1 is an overview diagram of an exemplary serverless cashless gaming system, in accordance with an embodiment of the present invention. As shown therein, a serverless gaming system 100 according to an embodiment of the present invention may include a plurality of gaming terminals 104, a cashier terminal 106 or an automated cashier 108, all communicating via a wired and/or wireless network 102. Wireless entry devices such as laptops 110 using 802.11 (for example), palmtops 112 using Bluetooth or 802.11 (for example), or Wireless Application Protocol (WAP) phones (for example) may advantageously be used in some premises for operators to consult and credit the game session meters. Advantageously, there is no central system (i.e., central server) controlling the gaming system 100.

FIG. 2 illustrates an exemplary cashless gaming machine 200 that does not accept or redeem cash. It is to be understood that the gaming machine 200 is but one possible implementation of such a cashless gaming machine and that the present invention is not limited thereto. For cashless operation, the gaming terminal is equipped with means of capturing the encoded information associated with a cashless instrument submitted. The cashless instrument may be a physical portable instrument such as: a paper voucher comprising printed codes; a strong paper ticket comprising printed codes and encoded magnetic codes; a rigid ID card comprising printed codes, magnetic codes or optical codes; a secure contact or contact-less electronic ID device comprising sophisticated electronic (a smart card or a smart dongle); or alternatively, a user ID and password to be typed or spoken, or alternatively again advanced biometric features (finger print, voice recognition, face recognition). The information captured from a cashless instrument is processed in order to derive a pointer to a location containing the necessary computer data to identify and validate the cashless instrument. The information captured from a cashless instrument may contain an encrypted signature (or hash) to ensure that the information has not been maliciously modified. In fine, the cashless instrument allows to derive a valid "identifier code" that is used by the software to execute the appropriate transactions to emulate the use of real cash for the cashless instrument submitted. The cashless instrument is thus denoted "ID instrument" hereafter. The ID instrument may be capable of storing additional information when accessed by a device, or alternatively be replaced by a new one (i.e. a newly printed ticket). The gaming machine ID device(s) accepting the ID instrument submitted may include a magnetic card reader 204, a SmartCard reader and writer 206, a barcode reader 210, a ticket printer 212, a biometric reader (finger print, voice identification, head identification, etc.), a touch-screen 202, keyboard or keypad to enable players to enter a PIN (Personal Identification Number). The gaming machine identification device(s) may further include an ID token reader to read other forms of advanced ID devices such as ID buttons, ID key-chains (such as disclosed, for example in commonly assigned US

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design patent entitled "Personal Communicator and Secure ID Device" Pat. No. D441,765 issued on May 8, 2001) as well as secure communication means for securely communicating with, for example, personal wallets, hand held computers or computer wrist-watch via infra red, magnetic field, capacitive charges or RF (Bluetooth, IEEE 802.11, etc.) for player identification purposes. A printer 212 may print bar-coded tickets 214 that can be read by a barcode reader 210.

FIG. 6 illustrates an example of a networked cashier terminal 600, according to an embodiment of the present invention. The terminal may include a computer 602 connected via wired or wireless link 603 to the network 102 with the gaming machines 104 and a ticket printer 604. The ticket printer 604 may include an integrated printer for printing tickets or receipts 606 that include a human and/or machine readable code imprinted thereon and code reader 608 for reading the code(s) imprinted on the ticket 606. The cashier terminal may also include, for example, a magnetic card reader 610, a SmartCard reader 612, a biometric reader 614 (such as a fingerprint reader, for example), a display 620 and input devices such as a keyboard 618 and/or a mouse 616. The cashier terminal may be controlled by an operating system capable of secure network communication such as Microsoft Windows, embedded XP or Linux, for example.

FIG. 3 illustrates an embodiment of an automated cashier 300, which dispenses with the need for a human cashier. The automated cashier 300 may include an internal computer connected to the network 102 with the gaming terminals 104, a coin acceptor 322, a note acceptor 320, a coin dispenser/topper 318, a SmartCard or magnetic card dispenser 304, a note dispenser 314, a ticket printer 310 for printing a ticket 312, a magnetic card reader 302, a SmartCard reader/writer 306, a barcode reader 308, display with touch-screen 326, a keypad 324, a video camera 328 and/or a UL 291 certified cash safe 316, for example. The UL 291 certified cash safe 316 prevents or deters robbery of the cash stored inside the automated cashier 300. The automated cashier 300 may further include biometric ID readers, ID token readers to read other forms of advanced ID devices such as ID buttons, ID key-chains, etc., as well as secure communications means for communicating with personal wallets, hand held PCs or computer wristwatch via infrared, magnetic field, capacitive charges or RF (Bluetooth, IEEE 802.11, etc.) for identification purposes.

According to one embodiment of the present invention, the gaming terminals (GT) 104 are advantageously configured to support functions traditionally implemented by central systems. FIG. 4 illustrates an embodiment of a serverless cashless gaming session according to the present invention. A patron 401 initially interacts with a cashier 402 to establish a cashless session 407 through to 412. The patron 401 initializes a cashless session 408 by handing over an amount of money 407 (in whatever form) to the cashier 402. The cashier 402 initializes the cashless meters 410 located on a predetermined gaming terminal 404 by issuing a credit meters transaction 409 using a cashier terminal 600. The gaming terminal 404 executes a process 410 to initialize in persistent storage the cashless meters associated with this cashless session. The gaming terminal 404 may then return a session ID 411 for later access and retrieval. The cashier 402 may complete the cashless session 408 by providing the patron 401 with an ID instrument 412 corresponding to session ID 411. The ID instrument 412 may be or include a printed ticket with text and/or encoded barcode, a printed ticket with text and/or embedded encoded magnetic strip (such as a metro ticket, for example), a magnetic ID card, a

smart ID card, fingerprint recognition, voice recognition, face recognition, palm recognition (or any biometric recognition), ID buttons, ID key-chains, a personal electronic wallet, a secure handheld Computer, a secure mobile phone, a secure computer wrist watch, a bar-coded ticket, a bar-coded voucher or any imaginable way to associate identification means with a physical or electronic media. A PIN number may also be given for challenging the ID instrument. The identification of the cashless session may be entirely anonymous or alternatively, may be associated with the patron's identity or membership in some group. In the later case, necessary personal identification data may be captured by the cashier when money is deposited 407 and are submitted together with the credit meters 409 for persistent storage in the gaming terminal 404 during the process 410.

The exact same cashless session 407 through 412 may be performed by making use of the automated cashier 300 instead of the cashier terminal 600 wherein the role of the cashier 402 is replaced by an automated program executed in the automated cashier. Suitable peripherals may be attached to the automated cashier 300 to allow for the deposit of funds, capture of information and dispensing of ID instruments.

The start 413 of a cashless game session 414 may be identified by the patron 401 receiving the ID instrument 412. The end 436 of the cashless game session 414 may be identified by the patron 401 redeeming the credit balance of money 435 associated with his ID instrument 412, or when the credit associated with his ID is exhausted (null).

The patron 401 (who forms no part of the present invention and whose actions are only described herein to illustrate aspects of the present invention), subsequent to receiving an ID instrument 412, may execute a certain number of cashless operations associated with his ID instrument. The patron may choose any gaming terminal 403, 404, 405 or 406 to play on. In the illustration of FIG. 4, the patron first chooses the gaming terminal 403 and submits his ID instrument 415 to the gaming terminal 403. If the gaming terminal 403 does not have ownership of the cashless meters associated with the ID instrument submitted, it may immediately broadcast on the network 102 a request to acquire the cashless meters associated with the patron's ID instrument. All the gaming terminals on the network 102 intercept the broadcast. The gaming terminal 404 having ownership of the cashless meters initiates at 418 a transfer procedure 419 to transfer ownership and full content of the cashless meters associated with the ID 420 to the gaming terminal 403. Upon receiving ownership and content of the cashless meters, gaming terminal 403 initializes its local game meters with the value of the cashless meters received and enters a gaming session 421 wherein the patron may play continuously until credit is exhausted or until the cash-out signal 422 is activated. Any winning is added to the patron's credit balance.

When the cash-out signal 422 is activated by the patron, the player may use the remaining of his or her credit to play on another gaming terminal or redeem the credit for cash. A ticket showing the credit remaining may be printed if a printing device is available on gaming terminal 403. In the illustration of FIG. 4, patron 401 chooses to play on gaming terminal 406 and submits his ID instrument 423 to the gaming terminal 406. Gaming terminal 406 does not have ownership of the cashless meters associated with the ID instrument submitted. Therefore, it may immediately broadcast on the network a request to acquire the cashless meters associated with the ID instrument. All the gaming terminals on the network intercept the broadcast. The gaming terminal

403 having ownership of the cashless meters initiates a transfer procedure 426 to transfer ownership and full content of the cashless meters associated with the ID 427 to the gaming terminal 406. The gaming terminal 403 may deny the transfer of the meters if credit is exhausted or already paid, thus preventing the patron from playing on gaming terminal 406. Upon receiving ownership and content of the cashless meters, gaming terminal 406 initializes its local game meters with the value of the cashless meters received and enters a gaming session 428 wherein the patron may play continuously until credit is exhausted or until the cash-out signal 429 is activated. Any winning is added to the credit balance.

When the cash-out signal 429 is activated, the player may use any remaining credit to play on another gaming terminal or may redeem the credit for cash (or for credit on another payment instrument or account). A ticket showing the credit remaining may be printed if a printing device is available on gaming terminal 406. In the illustration of FIG. 4, patron 401 chooses to redeem his credit for cash. The patron submits his ID instrument at 430 to the cashier 402 who initiates a redeem process 431 that may immediately broadcast on the network a request to acquire the cashless meters associated with the ID instrument submitted 430. All the gaming terminals on the network intercept the broadcast. The gaming terminal 406 having ownership of the cashless meters authorizes payment by initiating a closure process 433 to terminate ownership of the cashless meters and forward the credit balance amount to pay at 434 to the cashier terminal 402. The gaming terminal 406 may deny payment if credit is exhausted. Upon receiving the authorization from gaming terminal 406, the cashier 402 then hands over the associated money 435 to the patron 401. The cashless game session associated with the ID instrument 414 terminates 436 when the patron receives his money 435. It is understood that the actions of the cashier described herein may be readily automated.

In another embodiment of the present invention, the patron may request partial payment of the credit available. In that case, the gaming terminal 406 having ownership of the cashless meters associated with the patron or the patron's ID instrument authorizes payment and initiates an update process instead of a closure process 433 in order to reflect the amount of payment made. Subsequently, the patron may continue to play on any gaming terminal or later redeem his credits at a cashier using his ID instrument.

For clarity of illustration, the server-less gaming session 400 of FIG. 4 shows only four game terminals and one cashier operating over a peer-to-peer platform. This is an ideal scenario for small game operators. It should be apparent to those acquainted with modern network architectures that the peer-to-peer architecture disclosed herein is highly scalable and robust and that the scenario 400 can be extended to a large gaming estate comprising tens of thousands of gaming terminals and hundreds of cashier terminals or automated cashiers. Moreover, peer-to-peer mechanisms may be provided by modern operating systems such as Microsoft .NET and secure network protocols may be automatically activated by setting the appropriate security policy such as Internet Protocol Security (IPSec) or Secure Socket Layer (SSL), for example. Furthermore, cashier terminals 600 and automated cashier 300 only require simple "stateless".NET client applications or web browser sessions for interacting with the gaming terminals 104. The term "stateless" denotes that the software that executes in the cashier terminal 600 and in the automated cashier 300 is not responsible for managing and recording the game session



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implicit state or context. The context of a software session is the ordered sequence of properties of the software objects that defines it at a particular instant in time. The context (or implicit state) of a cashless gaming session is controlled and recorded by the gaming terminal that owns the associated cashless session meters. The context of a cashless gaming session includes the meters. The gaming terminal may advantageously store the game session context that includes the meters in a non-volatile memory for fault-tolerance.

The method and a server-less gaming session 400 of the present invention and illustrated on FIG. 4 is further illustrated in a flowchart 700 of FIG. 7. As shown, a patron remits funds to any of the cashiers at 702, whereupon the cashier initializes meters on a predetermined gaming terminal at 704 and the cashier dispenses and ID instrument to the patron at 706. At 708, the patron may choose to play on a gaming terminal at 710 or go to the cashier 734 to redeem his credit, such as shown at 732.

The patron submits his ID instrument at 712 to the selected gaming terminal that requests transfer of meters associated with the ID instrument from a previous gaming terminal 714 (the gaming terminal on which the patron last played), or alternatively in the case whereby the patron has just remitted funds to a cashier, from the gaming terminal on which the cashier has initialized the meters on. The previous gaming terminal may deny transfer of meters if the credit is exhausted or already paid, thus preventing the patron from playing a game.

Once the transfer of meters from a previous gaming terminal is successfully completed, the patron may repetitively play a game at 716 as long as his credit is not exhausted as shown at 718 or the cash-out signal has not been activated 722, 726. In case credit is exhausted 728, the patron can no longer play and the cashless game session terminates at 730.

After activating the cash-out signal 722, 724, the patron may choose another gaming terminal 708 and proceed as described above. If the patron no longer wishes to play 732, he may go to a cashier 734 to redeem his credit by submitting his ID instrument 736. The cashier may use his network entry terminal to obtain payment authorization from the previous gaming terminal 738. If authorization is given, the credit amount available in the meters of the previous gaming machine may be paid by the cashier 740, and the meters at the previous gaming terminal may be updated to reflect the payment.

Traditionally and in compliance with gaming jurisdictions, gaming terminals may contain a set of highly secure persistent meters comprising essentially the patron's credit balance, the meters associated with a variety of events such as coins inserted and coins given out for a particular game, and an audit log of events for later examination if required. The operation for updating the meters in accordance with the game session activity is commonly referred as metering. Metering also infers that the necessary storage and access means to the meters are available. Applying modern object oriented programming and persistent data storage techniques such as structured access to non-volatile memory, the meters may be defined as a class that is dynamically instantiated at run time. It may be clear to those acquainted with object programming that a multitude of instantiations of the meters class may be obtained, the only limitation being the memory available. Memory being plentiful on a typical computer unit controlling a gaming terminal, a substantial number of instantiations of the meters class may be obtained.

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FIG. 5 illustrates the instantiation of a number of cashless meters 500 that may be obtained on a gaming terminal 502. The gaming terminal 502 has taken ownership of the cashless meters associated with each of the patrons' submitted ID instrument for ID(x), ID(y) through ID(z) and the gaming activity in process on gaming terminal 502 is reflected in the current session cashless meters 504. The credit balance displayed to the patron currently playing corresponds to the credit balance meter 506; the other meters 508 and the audit log 510 may be reserved for use by the game operator. The cashless meters may be frozen when the patron activates the cash-out signal.

The other meters 512, 514 and 516 are associated with gaming sessions played previously on the gaming terminal 502 and are frozen. Alternatively, any of the meters 512, 514 or 516 may be associated with a new cashless session initiated by the cashier when the patron deposit funds as explained relative to steps 407 to 412. Gaming terminal 502 retain ownership of the frozen meters until ownership is requested by another gaming terminal. If the credit remaining on these meters is exhausted, transfer of ownership to another gaming terminal is denied. If a redeem operation is requested by the cashier terminal or the automated cashier while some credit is available, the gaming terminal 502 authorizes payment, closes the meters and retains ownership of the closed meters. The closed meters may be erased at a later time in order to recover storage space in accordance with the gaming operator's rules for flushing old data.

The peer-to-peer metering method object of the present invention is suitable for supporting all forms of cashless instruments such as:

- a player account;
- an anonymous game session account;
- a voucher verification account;
- a time gaming account;
- a smartcard reconciliation account.

A cashless player account is identified by a unique identifier key assigned to a patron that points to a set of records stored in computer memory containing the patron's personal details and the state of the cashless session. The records may be queried and updated by authorized software using the key that may be derived from the ID instrument submitted. The state of the cashless session comprises essentially the balance of monetary credit available to the patron (the primary meters) and some auxiliary attributes (secondary meters) reflecting the games played, the time stamping of various operations, a flag indicating if the meters are owned by the gaming terminal hosting the meters and a flag indicating if available credits have already been paid.

An anonymous game session account is identified by a unique identifier key assigned to a game session that points to a set of records stored in computer memory containing the state of the cashless session. The records may be queried and updated by authorized software using the key that may be derived from the ID instrument submitted. The state of the cashless session comprises essentially (the primary meters) the balance of monetary credit available to the anonymous older of the ID instrument and some auxiliary attributes (secondary meters) reflecting the games played, the time stamping of various operations, a flag indicating if the meters are owned by the gaming terminal hosting the meters and a flag indicating if available credits have already been paid.

A voucher verification account is identified by a unique identifier key assigned to a voucher that points to a set of records stored in computer memory containing the state of

the cashless session. The records may be queried and updated by authorized software using the key that may be derived from the voucher submitted. The state of the cashless session comprises essentially (the primary meters) the balance of monetary credit available to the holder of the voucher and verification data, and some auxiliary attributes (secondary meters) reflecting the games played, the time stamping of various operations, a flag indicating if the meters are owned by the gaming terminal hosting the meters, and a flag indicating if available credits have already been paid. In the case of a cash-out at the gaming terminal or alternatively when funds are remitted to a human cashier or an automated cashier, a voucher comprising clear text and machine-readable code representing the monetary value of the credit available and some verification data is dispensed. The clear text may indicate the value of the credit available, or simply said for the holder, "the value of voucher". In the case of a cash-in at the gaming terminal or alternatively when requesting the redeem of credits to a human cashier or an automated cashier, a voucher comprising clear text and machine-readable code representing the monetary value of the credit available and some verification data is read. The unique identifier key is derived from the verification data upon reading the clear text and/or the machine-readable code. The associated records are then queried in order to authenticate the value of the voucher by comparing the verification data contained in the records with the verification data read from the voucher. It should be apparent to those acquainted with secure transactional techniques that the unique identifier key, or alternatively the verification data, may be a hash or an encrypted signature of all or portion of the clear text and/or the machine-readable code.

A time gaming account may be associated to a patron or be anonymous.

A time gaming player account is identified by a unique identifier key assigned to a patron that points to a set of records stored in computer memory containing the patron's personal details and the state of the cashless session. The records may be queried and updated by authorized software using the key that may be derived from the ID instrument submitted. The state of the cashless session comprises essentially (the primary meters) the balance of time-to-play and the total of winnings available to the patron, and some auxiliary attributes (secondary meters) reflecting the games played, the time stamping of various operations, a flag indicating if the meters are owned by the gaming terminal hosting the meters and a flag indicating if available credits have already been redeeming.

An anonymous time gaming account is identified by a unique identifier key assigned to a gaming session that points to a set of records stored in computer memory containing the state of the cashless session. The records may be queried and updated by authorized software using the key that may be derived from the ID instrument submitted. The state of the cashless session comprises essentially (the primary meters) the balance of time-to-play and the total of winnings available to the anonymous holder of the ID instrument, and some auxiliary attributes (secondary meters) reflecting the games played, the time stamping of various operations, a flag indicating if the meters are owned by the gaming terminal hosting the meters and a flag indicating if available credits have already been redeeming.

A smartcard reconciliation account is identified by a unique identifier key assigned to a smartcard that points to a set of records stored in computer memory. The records therefor are a "slave" mirrored copy of same records containing the state of the cashless session that are maintained

in the electronic circuits of the smartcard. The smartcard maintains the "master" copy of the records. The slaved mirrored records may be queried but not updated by authorized software using the key that may be derived from the smartcard submitted. The state of the cashless session comprises essentially the balance of credit available to the holder of the smartcard (the primary meters) and some auxiliary attributes (secondary meters) reflecting the games played, the time stamping of various operations, a flag indicating if the meters are owned by the gaming terminal hosting the meters and a flag indicating if available credits have already been paid. The slaved mirrored records are used to reconcile accounting when the smartcard is used in order to detect possible forgery. Alternatively, the slaved mirrored records are used as a backup repository to pay the holder of the smartcard in case of the failure of the smartcard. When used for backup, the "slave" records may be updated by authorized software using the key that may be derived from the smartcard submitted (embossed code for example).

The ID instrument used to derive the unique identifier key may be submitted in a variety of ways such as typing a user ID and password, keying-in a code on a keypad, presenting a bar-coded voucher, an encoded card, a secure electronic ID device or recognizing biometric features.

The unique identifier keys are commonly called GUI or global unique identifier.

Fault tolerance may be achieved by replicating (mirroring) cashless meters owned by a given gaming terminal to a predetermined number of other peer gaming terminals. The gaming terminals holding replicated cashless meters are second-level owners that may be solicited in case the primary owner does not respond to the initial transfer request, whether the request is a direct one to an identified gaming terminal or broadcast to all gaming terminals on the network. For example, in case gaming terminal 403 does not obtain any reply subsequent to its transfer request broadcast 417 after a time-out, a new broadcast message explicitly soliciting secondary owners may be sent on the network. Gaming machine 403 would then accept the transfer of cashless meters from a responding secondary owner.

In another embodiment of the present invention, the gaming terminal may be able to encode information on the ID instrument submitted by the patron. The identification of the gaming machine used by the patron may advantageously be encoded on the ID instrument such that the next used gaming terminal knows immediately upon reading the ID instrument the identity of the previously used gaming terminal. Consequently, the next used terminal may establish network communication with the previously used gaming terminal without having to rely on network broadcasting techniques to find out which of the connected gaming terminals is the last used gaming terminal, thus reducing the time to start transferring the meters and the overall network traffic. In case the last gaming terminal is not contactable, a network broadcast to find a secondary owner of the meters may be initiated.

#### Conclusions

The invention offers a simple distributed peer-to-peer metering of cashless game sessions that is secure, robust, scalable and that requires no central system.

All the sensitive operations are carried out by the secure software (preferably certified by a recognized test laboratory) that executes in each gaming machine. All the access points to any of the gaming terminals such as the cashier terminal or the automated cashier require only basic stateless client applications operating over a secure network protocol such as IPSec or SSL. Moreover, sophisticated

relational databases are not required. Wireless laptops or palmtops may be advantageously used as entry or control terminals.

The invention supports all forms of cashless instruments such as:

- a player account whereby primary meters are the monetary credit balance associated to a patron ID;
- an anonymous game session account whereby primary meters are the monetary credit balance associated to a game session ID;
- a voucher verification account whereby the primary meters are the monetary value and the hash associated to the value amount and the encrypted signature printed or encoded on the voucher;
- a time gaming account whereby the primary meters are the time-to-play balance and the total of the winnings associated to a patron ID or to a game session ID;
- a smartcard reconciliation account whereby the primary meters are a mirrored copy of the meters managed in the secure electronic module of the smartcard.

The invention may be advantageously deployed for small to medium size game operators.

What is claimed is:

1. A method for metering a cashless game session played by a patron on a network including a plurality of networked gaming terminals, the method comprising the steps of:

- a) initializing meters assigned to the game session with a credit amount corresponding to funds received from the patron in a predetermined first gaming terminal of the plurality of networked gaming terminals;
- b) if the patron does not initiate the gaming session on the first gaming terminal, transferring the meters assigned to the game session over the network from the meters in the first gaming terminal directly to meters in whichever gaming terminal of the plurality of networked gaming terminals on which the patron initiates a gaming session, the transferring being requested by the gaming terminal on which the patron initiates a gaming session;
- c) metering the game session activity in the gaming terminal on which the patron initiates a gaming session;
- d) transferring the meters assigned to the game session over the network directly to meters in whichever gaming terminal of the plurality of networked gaming terminals on which the patron initiates a gaming session, the transferring being requested by the gaming terminal on which the patron initiates a gaming session, and

repeating steps c) and d) as and if needed until the credit amount associated with the meters assigned to the game session is exhausted or a cash-out is requested by the patron.

2. The method of claim 1, wherein the plurality of gaming terminals operate in a peer-to-peer fashion.

3. The method of claim 1, further including a step of issuing a unique ID instrument, the issued ID instrument being associated with the meters assigned to one of the selected one of a player account, an anonymous game session account, a voucher verification account, a time gaming account and a smartcard reconciliation account.

4. The method of claim 3, further including reading and validating the issued ID instrument prior to enabling the patron to initiate a gaming session.

5. The method of claim 3, wherein an entry terminal is connected to the network, and upon receiving a cash-out

request by the patron at the gaming terminal and validating the patron's ID instrument at the gaming terminal carrying out steps of:

the network entry terminal requesting payment authorization from a last gaming terminal on which the patron initiated a gaming session, and

paying the patron an amount corresponding to a remaining credit in the meters stored in the last gaming terminal on which the patron initiated a gaming session.

6. The method of claim 5, wherein the network connected entry terminal is one of automatic and operated by a cashier.

7. The method of claim 5, wherein a network broadcasting step is carried out by the network entry terminal to determine the last gaming terminal on which the patron initiated a gaming session.

8. The method of claim 5, wherein the meters stored on the last gaming terminal on which the patron initiated a gaming session are updated to reflect payment to the patron.

9. The method of claim 5, wherein the network entry terminal is stateless.

10. The method of claim 9, wherein the network entry terminal includes one of a web browser and a stateless application that does not manage or record a state or context of the game session.

11. The method of claim 3, further including a step of a last gaming terminal on which the patron initiated a gaming session denying payment to the patron if the credit amount associated with the meters assigned to the same session is zero or if the credit amount associated with the meters assigned to the game session has already been paid.

12. The method of claim 1, wherein the transfer steps are carried out securely.

13. The method of claim 1, wherein the transferring steps are carried out at least partly wirelessly.

14. The method of claim 1, wherein the transferring steps are carried out securely and at least partly wirelessly.

15. The method of claim 1, further comprising the step of providing a plurality of entry terminals connected to the network, to allow patrons to deposit funds and to be paid.

16. The method of claim 15, wherein the entry terminals are one of operated by a cashier and automatic.

17. The method of claim 3, wherein the ID instrument is anonymous.

18. The method of claim 3, wherein the ID instrument is associated with a personal information of the patron.

19. The method of claim 3, wherein the ID instrument includes at least one of a printed ticket with text and/or an encoded barcode, a printed ticket with text and/or embedded encoded magnetic strip, a magnetic ID card, a smart ID card, biometric recognition, an ID button, an ID key-chain, a personal electronic wallet, a secure handheld Computer, a secure mobile phone, a secure computer wrist watch and a keyboard or keypad and username, password combination.

20. The method of claim 3, wherein the ID instrument is associated with a membership of the patron.

21. The method of claim 1, wherein a network broadcasting step is carried out prior to step d) to determine which of the plurality of networked gaming terminals currently stores the meters assigned to the game session.

22. The method of claim 3, wherein the ID instrument is configured to store an identifier of a last gaming machine on which the patron initiated a gaming session.

23. The method of claim 22, further comprising steps of: denying, by the last gaming terminal, a transfer request to transfer meters to another gaming terminal if a credit associated with the ID instrument submitted is exhausted, and

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preventing, by the last gaming terminal, the patron from playing the gaming terminal to which the ID instrument is submitted when the transfer request is denied.

24. A system for metering cashless game sessions for a plurality of networked gaming terminals comprising:

at least one ID instrument;  
at least one network connected entry terminal comprising:  
means of accepting and/or dispensing the at least one ID instrument;

computer means of interacting with the networked gaming terminals;

each of the plurality of gaming terminals comprising:  
means of accepting the at least one ID instrument submitted by a patron;

gaming means for the patron to play;  
metering means configured to store the context of the game session activity;

meters associated with the at least one ID instrument and stored in the metering means;

computer means to transfer, upon request, the meters directly to a requesting one of the plurality of networked gaming terminals;

computer means to request and accept the transfer of the meters directly from another of the plurality of networked gaming terminals;

a cash-out function, and

processing means to authorize or deny payment requested by the at least one cashier network entry terminal.

25. The system of claim 24, wherein the ID instrument includes at least one of a printed ticket with text and/or an encoded barcode, a printed ticket with text and/or embedded encoded magnetic strip, a magnetic ID card, a smart ID card, biometric recognition, an ID button, an ID key-chain, a personal electronic wallet, a secure handheld Computer, a secure mobile phone, a secure computer wrist watch and a keyboard or keypad and username, password combination.

26. The system of claim 24, wherein the ID instrument is associated to one of the selected one of a player account, an anonymous game session account, a voucher verification account, a time gaming account and a smartcard reconciliation account.

27. The system of claim 24, wherein the plurality of gaming terminals are networked and operate in a peer-to-peer fashion.

28. The system of claim 24, wherein the computer means to request transfer are configured to one of:

broadcast the requests over the network, and  
request the meters from an identified one of the plurality of networked gaming terminals.

29. The system of claim 24, wherein the ID instrument is configured to store an identification of a last played gaming terminal of the plurality of gaming terminals.

30. A method for metering cashless game sessions for an estate of networked gaming terminals comprising the steps of:

a) using one of at least one network connected entry terminal to initialize first meters located on a predetermined first gaming terminal within the estate with a credit amount corresponding to funds deposited by a patron, the first meters being associated with an ID instrument;

b) issuing the ID instrument to the patron;

c) denoting the first gaming terminal as a previous gaming terminal and denoting the first meters as previous meters;

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d) repeating step e) to i) each time the patron selects a new gaming terminal from the estate, and proceeding to step k) when the patron wishes to redeem the credit amount;

e) the new gaming terminal accepting the ID instrument from the patron;

f) the new gaming terminal requesting the previous gaming terminal to transfer the previous meters;

g) directly transferring the previous meters from the previous gaming terminal into new meters located on the new gaming terminal;

h) the new gaming terminal metering the gaming of the patron using the new meters until a cash-out signal is activated;

i) denoting the new gaming terminal as the previous terminal and denoting the new meters as the previous meters;

j) using one of the at least one network connected entry terminal to request the previous gaming terminal to authorize payment of credit associated with the ID instrument;

k) the previous gaming terminal returning an authorization for the payment to the requesting network connected entry terminal;

l) the previous gaming terminal updating the previous meters to reflect the payment, and

m) paying the payment to patron.

31. The method of claim 30, wherein steps a) and j) are carried out using at least one stateless network-connected entry terminal.

32. The method of claim 31, wherein the network-connected entry terminal includes one of a web browser and a stateless application that does not manage or record a state or context of the game session.

33. The method of claim 30, wherein the previous gaming terminal denies payment for the ID instrument in step k if the credit of the previous meters is exhausted or has already been paid.

34. The method of claim 30, wherein each step that includes communication over the network is carried out securely.

35. The method of claim 30, wherein each step that includes communication over the network is carried out at least partly wirelessly.

36. The method of claim 30, wherein each step that includes communication over the network is carried out securely and at least partly wirelessly.

37. The method of claim 30, further including an initial step of providing a plurality of stateless network-connected entry terminals operated by cashiers to allow patrons to deposit funds and to redeem credits, the plurality of stateless network-connected entry terminals including at least one of a web browser and a stateless application that does not manage or record a state or context of the game session.

38. The method of claim 30, wherein the ID instrument includes at least one of a printed ticket with text and/or an encoded barcode, a printed ticket with text and/or embedded encoded magnetic strip, a magnetic ID card, a smart ID card, biometric recognition, an ID button, an ID key-chain, a personal electronic wallet, a secure handheld computer, a secure mobile phone, a secure computer wrist watch and a keyboard or keypad and username, password combination.

39. The system of claim 30, wherein the ID instrument is associated to one of the selected one of a player account, an anonymous game session account, a voucher verification account, a time gaming account and a smartcard reconciliation account.

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40. The method of claim 30, wherein the ID instrument is anonymous.

41. The method of claim 30, wherein the ID instrument is associated with a personal information of the patron.

42. The method of claim 30, wherein the ID instrument is associated with a membership of the patron.

43. The method of claim 30, wherein requests to transfer meters use network broadcasting wherein the requests are broadcast to each of the operating gaming terminals in the estate.

44. The method of claim 30, wherein the ID instrument is configured to store an identifier of the gaming machine on which the patron last played, the identifier being read by the network connected entry terminal or by a selected one of the gaming terminals of the estate to enable the selected one gaming terminal to use the stored identifier to directly contact the gaming machine which the patron last played in lieu of network broadcasting.

45. The method of claim 30, wherein the new gaming terminal terminates the gaming of the patron at step h) if the credit amount is exhausted.

46. The method of claim 30, wherein step j) enables the patron to request full or partial payment on any remaining credit.

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47. The method of claim 30, further comprising a step of mirroring meters for each gaming terminal of the estate having an active gaming session in at least one other predetermined gaming terminal of the estate to achieve fault tolerance, the at least one other predetermined gaming terminal being configured to provide the mirrored meters to a requesting network connected entry terminal or a requesting gaming terminal upon failure of a requested gaming terminal to respond to a request for meters.

48. The method of claim 30, wherein each of the at least one network connected entry terminals is integrated within a respective gaming terminal of the estate.

49. The method of claim 30, wherein the at least one network connected entry terminal is configured to be operated by a human cashier.

50. The method of claim 30, wherein the at least one network connected entry terminal is automated.

51. The method of claim 30, wherein the at least one network-connected entry terminal is stateless.

52. The method of claim 51, wherein the network-connected entry terminal includes one of a web browser and a stateless application that does not manage or record a state or context of the game session.

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